

EXHIBIT C

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION**

IN RE: ETHICON, INC. PELVIC REPAIR SYSTEM PRODUCTS LIABILITY LITIGATION <hr/> THIS DOCUMENT RELATES TO: <i>Ronda L. Reed v. Ethicon, Inc</i> Case No. 2:12-cv-03082	Master File No. 2:12-MD-02327 MDL No. 2327 JOSEPH R. GOODWIN U.S. DISTRICT JUDGE
---	---

**CLINICO-PATHOLOGICAL CORRELATION OF COMPLICATIONS EXPERIENCED BY
MS. RONDA REED (LAYTON)**

This section of the report provides a case-specific assessment. A complete report includes the general and the case specific sections. My opinions are based on both, the case specific assessment and the opinions described in the general part.

Summary of clinical records

I reviewed the listed below clinical records. The purpose of my summary is not a comprehensive analysis to perform a clinical differential diagnosis. The clinical differential diagnosis had already been performed and resulted in mesh excision. The purpose of my review is to collect the clinical information related to the examined specimen before I perform the morphological differential diagnosis and correlate the pathological changes to the clinical information. The records were screened focusing on:

- Type and general anatomical placement site of the mesh device and the chronology of mesh implantation, alteration and excision
- Reported complications and conclusions of the physicians who worked up the clinical differential diagnosis and came to the decision to excise the mesh
- Symptoms, procedures and the results of investigations that potentially could be anatomically, temporary and pathophysiologically related to the urogenital area, the mesh, and the excised specimen

Records reviewed:

Saint Joseph Medical Center
Gulf Coast Urology
Texas Heart Center
East Houston Regional Medical Center
Baytown Family Clinic
M&M Clinical Group
Houston Metro Urology
Women's Healthcare Center
Woman's Health Group
Dr. Hernandez-Buck
Jacinto Medical Group
Smith Medical Clinic
The Woman's Hospital of Texas
Dr. Hernandez-Buck
Dr. Bufford
Dr. Afzal
Dr. Frey
Dr. Aarons
Dr. Akinyeye
Dr. Berberain

Background medical history:

H. Pylori gastritis, reflux esophagitis (GERD), constipation, mitral valve prolapse (with palpitations and syncope)

Background surgical history:

Inguinal Hernia Repair (right), hemorrhoidectomy, canthal cyst excision

Urogynecological history:

02/25/2006. San Jacinto Methodist Hospital. Laparoscopic right ovarian cystectomy.

04/28/2006. Woman's Health Group. Difficult to read handwritten note. Pelvic pain, LLQ pain

10/11/2006. Woman's Health Group. Difficult to read handwritten note. Pelvic pain, LLQ pain

12/28/06. The Woman's Hospital of Texas. Dr. Cowan. This is a 27-year-old white female, gravida 4, para 3, abortion 1, status post tubal ligation. Her last menstrual period was 12/18/06. The patient initially came to see me in July of 2005 complaining of dysfunctional bleeding, which was not responding well to Yasmin, and with pain in the her right and left lower quadrants [sic]. She complained of some deep dyspareunia at that time, and had stress urinary incontinence, which began after the birth of her second child. She began having increasing left lower quadrant pain in April of 2006, and had an ultrasound performed at that time looking for an ovarian cyst, and was noted to have a heterogeneous echo texture of the myometrial, and 2 fibroids were noted measuring 2.2 x 1.7-cm and 1.64-cm. The left ovary contained a dominant follicle, and multiple other small follicular cysts, and the right ovary contained several follicles, but no cysts. A repeat ultrasound was performed in October that showed a 14-mm unilocular cyst in her left ovary. Nothing abnormal in the right ovary, and the heterogeneous echo texture of the uterus was again seen. possibly related to adenomyosis. On physical exam in October, her uterus was very tender to palpation, which is also consistent with a diagnosis of adenomyosis.

Exam: The uterus was normal size anterior to mid position, mobile, and very tender The adnexa were slightly tender bilaterally, and she was noted to have a large rectocele. Pap smear showed atypical squamous cells of undetermined significance, and HPV typing was negative.

Assessment: Gravida 4, para 3, abortion I, with stress urinary incontinence, pelvic pain with physical findings and ultrasound consistent with adenomyosis, and a symptomatic rectocele requiring pressure on her perineum in order to expel stool.

12/29/2006. Dr. Sutton. A 27-year-old female who complains of significant stress incontinence, and has evidence of adenomyosis and is undergoing a hysterectomy. Because of this incontinence problem, that what she is consulted for. She wears at least 2 to 3 panty liners a day, has some mild urgency symptoms, but the biggest part is the stress incontinence issues. She has had rare bladder infections.

ASSESSMENT:

Mixed urinary incontinence with a stress component much greater than the urgency component.

12/29/2006. The Woman's Hospital of Texas. Placement of a Gynecare TVT-O sling. Total vaginal hysterectomy and posterior colporrhaphy. During the TVT-O sling placement the long curved Mayo scissors were used as a spacer to avoid tension. Cystoscopy confirmed that there was no bladder injury.

Pathology:

Uterus, hysterectomy

- Cervix - chronic inflammation, epithelial changes
- Endometrium – proliferative
- Myometrium - adenomyosis

Vaginal mucosa, resection - no diagnosis.

02/01/2007. Woman's Health Group. Handwritten note. 6 wks postop. Still has odor, cuff well healed, vagina with yellowish discharge, bimanual – no masses, wet mount – clue cells.

Impression: healing well, BV.

05/14/2008. Dr. Aarons This patient is a 29 year old white female who states she gets frequent bladder infections. Her PCP is Dr. Akinyeye. She states she had a urethral sling procedure on January 29, 2006 per Dr. Sutton in Houston. She was having urinary incontinence at that time. The operation stopped most of her incontinence. She no longer wets her pants when she coughs or sneezes. She sometimes has problems getting to the bathroom on time when she has the urge to void but that is not very common. She does not think she empties her bladder completely. She states it takes a long time to empty her bladder. She has not had a cystoscopy since the operation. The infections started after she had her operation. She has also been having pain in her lower abdomen and in her sides. She is also having low back pain as well. There is no prior history of kidney stones. There was minimal mobility of the urethra upon coughing and she did not leak a drop upon coughing in lithotomy position.

05/22/2008. Cystoscopy. CT scan revealed small non-obstructing stone in the left kidney. Normal cystoscopy.

03/08/2016. Gulf Coast Urology. Dr. Bertini. Is here for a weak and slow urinary stream. She does have to strain or bear down to start her urinary stream. She does have to wait a long time to start her urinary stream. She does have an abnormal sensation when needing to urinate. She does void little amounts. She does not have a good size and strength to her urinary stream. She does have recurrent infections. She has had UTIs in the last 12 months.

Her urge incontinence began 10 years ago (since 2006 surgery). Her symptoms have gotten worse over the last year.

Vaginal exam: Mild introital stenosis. No atrophy. No rectocele. No cystocele. No enterocele.
Tender to left and right of urethra.

Notes: I am concerned her operation of 2006 caused bladder outlet obstruction.

03/24/2016. Gulf Coast Urology. Urodynamic evaluation. Urge incontinence; nocturia, urgency with straining

Additional comments: Cystocele with feeling of not emptying bladder. Patient able to feel all sensations on test. She did not demonstrate any stress incontinence but did have urge at capacity. Cipro #1 was given and a follow up was made.

03/28/2016. Dr. Memon. PT has lower back pain, having low back pain more than usual, had bladder sling in past, complaint of urinary problems, unable to urinate, has to self catheterize, saw new doctor and is having sling removed

05/13/2016. Gulf Coast Urology. Preoperative evaluation. Is here for urge incontinence. Since 2006 surgery. She has high pressure (obstructed) voiding from sling that has lead to unstable detrusor. Her urge incontinence began 10 years ago. Her symptoms have gotten worse over the last year. She does wear protective pads. She wears 2-3 pads per day. She gets up at night to urinate 3 times.

05/13/2016. Gulf Coast Urology. Dr. Bertini. Urethrolisis and excision of vaginal mesh.

POSTOPERATIVE DIAGNOSIS:

Urinary retention secondary to bladder outlet obstruction from a foreign body.

INDICATIONS FOR PROCEDURE:

Ms. Layton Salazar is a 37-year-old female, who previously underwent a mid urethral sling placement for stress urinary incontinence. She has subsequently developed bothersome irritative voiding symptoms as well as urinary retention and has now elected to undergo urethrolisis with excision of the mesh after we discussed the risks and benefits of that procedure.

FINDINGS:

1. Approximately 4 cm length of monofilament mesh was excised from around the distal urethra.
2. The urethra was verified to be intact with no injury from the mesh resection at the conclusion of the procedure on cystoscopy.

Intraoperatively: The spongiosum of the urethra was encountered and the urethra was isolated on both the left and right lateral sides from the surrounding tissue. The mid urethral sling was encountered at the

distal urethra and using sharp dissection, it was carefully dissected off the underlying urethra and dissected out laterally as far as safely possible away from the urethra. Once we were at least a 1.5 cm from the urethra laterally on both the left and right, the mesh was incised. The specimen was then passed off the table to pathology. We then performed cystoscopy to verify that the urethra was intact with no injury and that there was good efflux from the bilateral ureters indicating no injury to the ureters.

Pathology:

SJ-16-0 1839

SPECIMEN SUBMITTED:

Medical device, vaginal mesh removal

DIAGNOSIS:

Vaginal mesh, removal

- Net-like foreign body, consistent with vaginal mesh (gross description only)

HISTORY:

Urge incontinence, obstructive sling.

GROSS DESCRIPTION:

The case is received in one part, labeled with the patient's name "Ronda Layton Salazar" and accession number "SJ-16-01839", accompanied by a requisition slip labeled with the same patient name and accession number. Received in formalin labeled "vaginal mash" is a fragment of pink-tan net-like foreign body measuring 5 x 0.6 x 0.3 cm. No sections are taken.

Pathological findings

I received tissue in formalin in a container labeled:

Ronda Reed

DOS: 5-13-16

The pathology report of the receiving laboratory read as:

SJ-16-0 1839

SPECIMEN SUBMITTED:

Medical device, vaginal mesh removal

DIAGNOSIS:

Vaginal mesh, removal

- *Net-like foreign body, consistent with vaginal mesh (gross description only)*

HISTORY:

Urge incontinence, obstructive sling.

GROSS DESCRIPTION:

The case is received in one part, labeled with the patient's name "Ronda Layton Salazar" and accession number "SJ-16-01839", accompanied by a requisition slip labeled with the same patient name and accession number. Received in formalin labeled "vaginal mesh" is a fragment of pink-tan net-like foreign body measuring 5 x 0.6 x 0.3 cm. No sections are taken.

On opening of the container at St. Michael's Hospital there was an excised segment of a sling with in- and over-grown tissue (Figures RR1&2). One end of the sling was curled within the tissue and the other end was in a flat configuration. The specimen was divided into 4 sections and 2 were retained by the defense consultant. The remaining 2 cross sections were submitted for histological analysis as a routine specimen of St. Michael's Laboratory.

Microscopic sections showed monofilament mesh consistent with a TVT type of product. The mesh was incorporated by dense scar tissue where the gross impression of partially flat (Figures RR3) and partially curled/rolled configuration was confirmed (Figures RR4&5). The mesh was incorporated by the scar in this curled shape indicating that the deformation occurred in the body, when the scar tissue could fill and remodel within the curl. The mesh fibers showed associated foreign body type inflammatory reaction to the mesh material (Figure RR6).

Immunohistochemical stain for smooth muscle actin demonstrated that the mesh migrated into the muscular layer of the urethra (Figure RR7). Staining for S100 protein highlighted nerve branches in the scar plate (Figure RR8). No distorted nerves or neuroma type lesions were seen.

At higher magnification fibers of the mesh showed an outer layer of degraded polypropylene (Figures RR9-14). The degraded material became stained by the histological dyes while the non-degraded core remained clear. Although degraded, the layer retained birefringence (brightness in polarized light) and premanufactured inclusions of a blue dye of polypropylene. The degraded layer showed cracking indicating its brittleness.

There was no evidence of a naturally occurring, neoplastic or reactive disease in the excised tissue. All pathological changes in the tissue were related to the mesh.

Clinico-pathological correlation

Ms. Reed initially presented with pelvic pain and stress incontinence for which she was treated with hysterectomy and placement of a Gynecare TVT-O sling in December 2006. Mayo scissors were used as a spacer to avoid tensioning of the sling. Cystoscopy confirmed that there was no urethral or bladder injury. Pathological examination of the uterus confirmed the clinical diagnosis of adenomyosis which was assessed as the cause of the pelvic pain. Records in May 2008 indicated that the operation stopped most of the stress incontinence but she started experiencing urge incontinence. There was also description of pain in the lower abdomen and sides. CT scan revealed small non-obstructing stone in the left kidney. Cystoscopy was normal. Assessment in March 2016 described weak and slow urinary stream and the need to strain or bear down to start the urinary stream, also frequent UTIs. It was stated that the urge incontinence started after the 2006 surgery and the symptoms became worse. The sling was excised in May 2016 with indications for the surgery summarized as: urinary retention secondary to bladder outlet obstruction from a foreign body.

Overall, clinical investigations lead to repeated mesh revisions to treat the clinical symptoms. On pathological examination the excision specimen showed pathological changes related to the mesh only. There was no natural disease such as a neoplasm (tumor) or a non-neoplastic disease. Both clinical and morphological findings narrowed the differential diagnosis to the mesh as the only pathology in the tissue causing the clinical symptoms.

Further detailed examination of the excised tissue showed specific mesh-related pathological changes related to the complications:

Urinary symptoms:

The records indicated that placement of the TVT-O sling resulted in urinary outlet obstruction with associated symptoms of urge and frequent UTIs. The sling was excised to treat the complications.

It is an established knowledge that the mesh contracts after implantation, therefore the slings are placed “tension-free” in anticipation of the future tightening. Unfortunately, the process of postoperative sling tightening proved to be unpredictable and urethral obstruction became a recognized complication. In Ms. Reed’s case a spacer was used to limit the sling tension. The sling tightened after the surgery and resulted in outflow obstruction. Over the years the effect worsened ultimately leading to sling excision. Upon pathological examination the excised mesh did not show evidence of a non-mesh related pathological process. All changes in the excised tissue were related to the mesh. The mesh rolled up in a cord like structure and became incorporated and reinforced by dense scar tissue. The curling was caused by the specifics of the mesh design and the scar ingrowth was triggered by the mesh. As stated earlier contraction of the scar lead to sling overtightening while the cord like shape had a smaller area of pressure

distribution. Additionally, polypropylene degradation added to the sling stiffness. The overall effect was urethral obstruction and sling migration into the urethral wall. This also resulted in associated symptoms of frequent UTIs and irritation/urgency.

Based on the pathological findings described above; my review of the clinical records of Ms. Reed; my knowledge, training and experience in medicine and pathology; my review of the scientific literature and my own research work in the field of implantable mesh, it is my opinion to a reasonable degree of medical certainty, that the mesh and the mesh related pathological processes caused urinary obstruction and the associated de novo urinary symptoms for Ms. Reed. It is further my opinion to a reasonable degree of medical certainty that the tissue damage caused by the mesh and the revision surgery as well the residual parts of the mesh and the residual scarring continued and continue to pose a risk for the urinary symptoms for Ms. Reed.

Pain/Dyspareunia:

As described earlier the mesh curled and triggered tissue reaction resulting in scar ingrowth and encapsulation, innervation of the scar plate, tightening of the sling with its migration into and damage of the urethral wall. The tissues were subject to all regular mechanisms of pain including mechanical tensioning and distortion. The tissues were also subject to sensitization due to inflammation. Overall, these changes provided a background for the development of chronic pain.

Dyspareunia is a group of symptoms caused by the additional stressors and stimuli acting on vulnerable tissues. In cases of vaginal mesh complications, the mechanical stresses and the stimuli of intercourse are applied to the tissues already at risk for pain through several mechanisms. Additionally, during intercourse the sensitive vaginal mucosa is at risk for compression against the stiffened and tightened mesh-scar plate.

Based on my knowledge and experience, my review of the published literature and my own research in the field of implantable meshes, my review of the clinical records of Ms. Reed and examination of the specimen described above; it is my opinion to a reasonable degree of medical certainty that the mesh and the associated tissue changes posed a risk for vaginal/pelvic pain and dyspareunia symptoms for Ms. Reed. It is further my opinion to a reasonable degree of medical certainty that the residual parts of the mesh that were not removed during the excisions, as well as the scarring caused by the mesh and the excision surgeries continued and continue to pose a risk for pain and dyspareunia for Ms. Reed.

Polypropylene degradation:

The published literature, Ethicon studies, my research and the examination of the specimen described above indicated that polypropylene degrades while in the body.

The layer of degraded polypropylene acquired ability to retain histological dyes and showed cracking indicating changes of the structure and physical properties of the material. It retained birefringence (refractivity) and the premanufactured blue granules of polypropylene. These features were in line with the earlier Ethicon's studies based on examination of histological sections of implanted Prolene.

Since the entire surface of the mesh was degraded, all mesh-body interactions were occurring through this degraded material. Therefore, the effects of degradation were playing a role in all mesh related pathological processes described in this report. The chemical and cellular interactions were occurring through the degraded layer. Degradation of a substance invariably leads to its breakdown into smaller particles and/or new chemical substances. In cases of implanted materials, these products of degradation are released into the tissues. Within the bark, cracking indicates brittleness and internal contraction forces. The degraded polypropylene forms a continuous hardened brittle sheath around all mesh fibers contributing to mesh stiffening. Extensive cracking can also provide cavities to harbor bacteria, as is well known in microporous meshes.

Based on the pathological findings described above; my knowledge, training and experience; my review of the scientific literature, Ethicon internal documents and my own research work in the field of implantable devices, it is my opinion that polypropylene of the mesh device degraded while in the body of Ms. Reed.

I reserve the right to supplement this report if new information becomes available. My billing rate is \$475 per hour.

A handwritten signature in blue ink, appearing to read 'Vladimir Iakovlev', with a stylized, elongated horizontal stroke extending to the left.

Vladimir Iakovlev, MD, FRCPC, FCAP

DATE: July 6, 2016



Figure RR1. Gross specimen before division.

Note narrowed/curled part on the right and wider/flatter sling configuration on the left.



Figure RR2. Gross specimen before division.

Note narrowed/curled part on the right and wider/flatter sling configuration on the left.

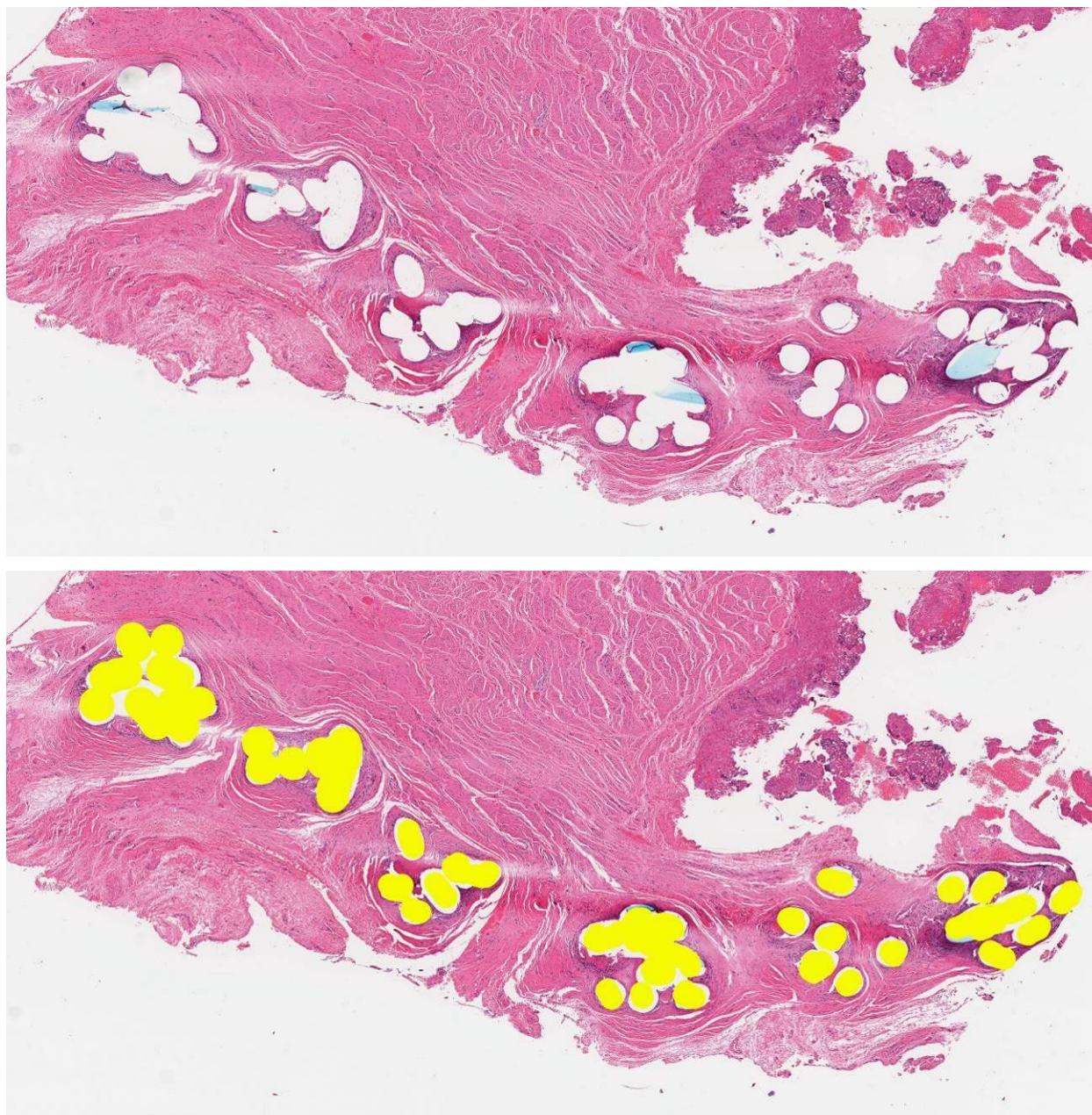


Figure RR3a. Mesh incorporated by scar tissue in a flat configuration, H&E, magnification equivalent to 4x objective.

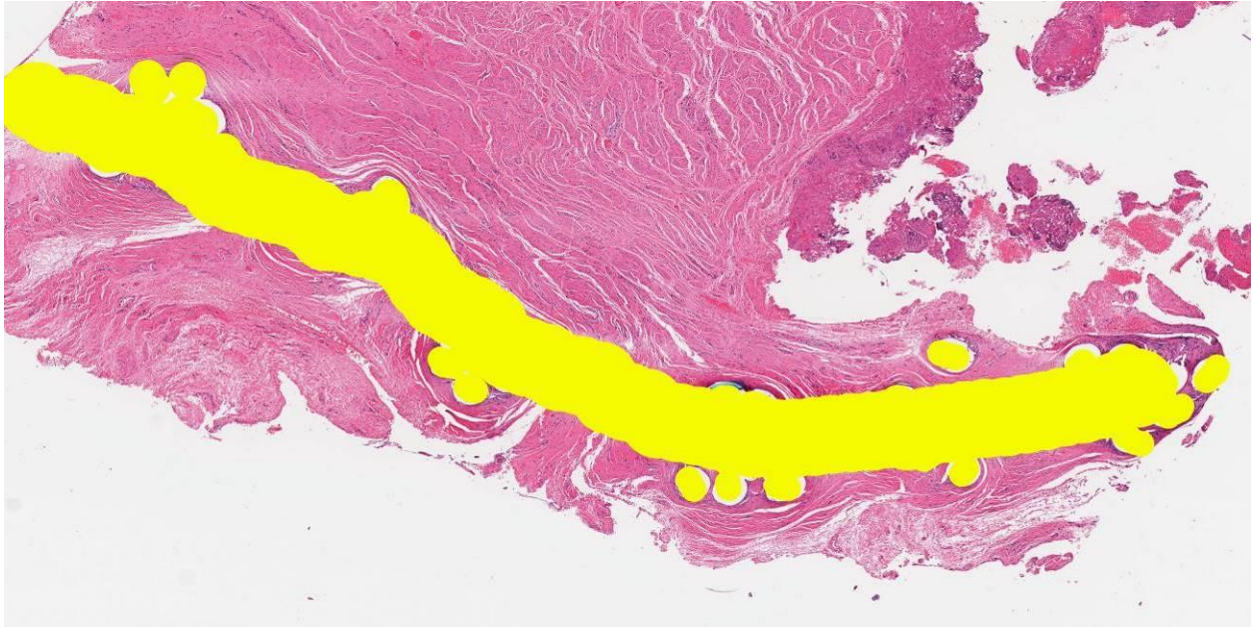


Figure RR3b. Mesh incorporated by scar tissue in a flat configuration, H&E, magnification equivalent to 4x objective.

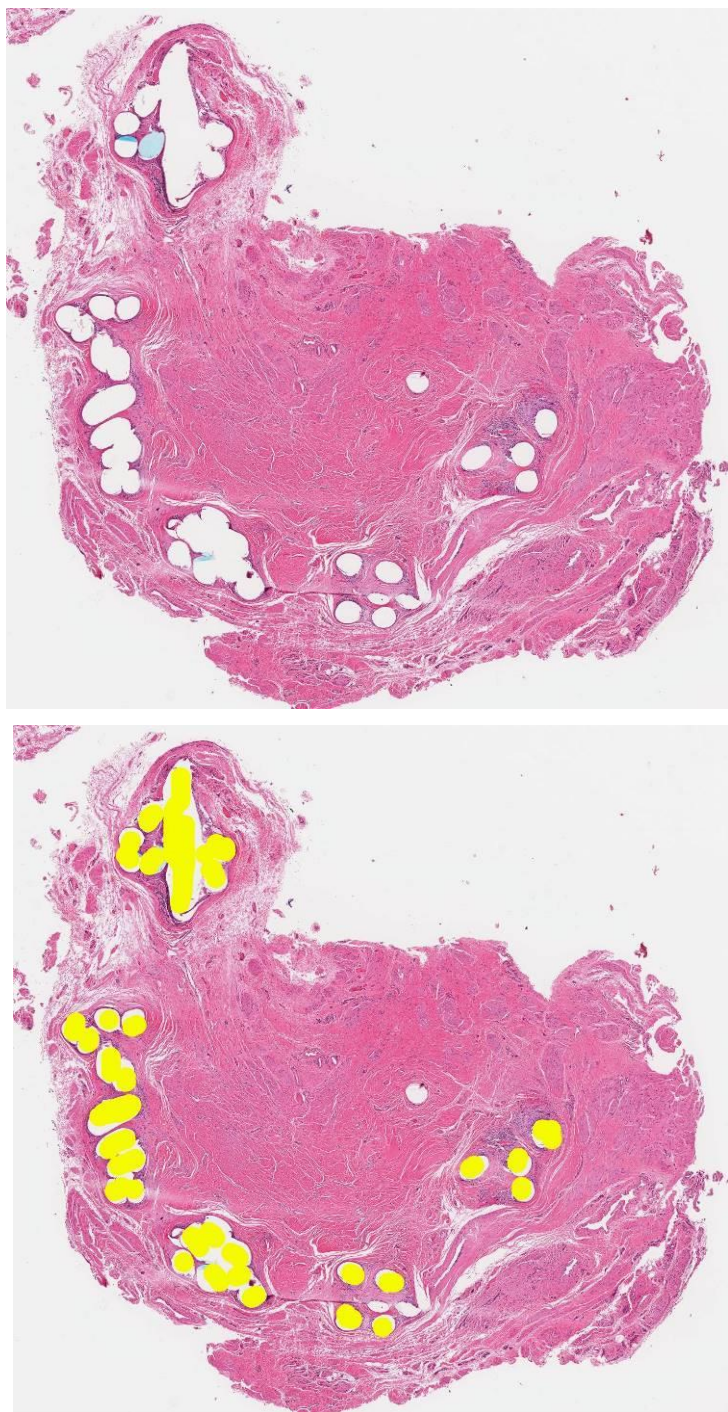


Figure RR4a. Mesh incorporated by scar tissue in a curled/rolled configuration, H&E, magnification equivalent to 4x objective.

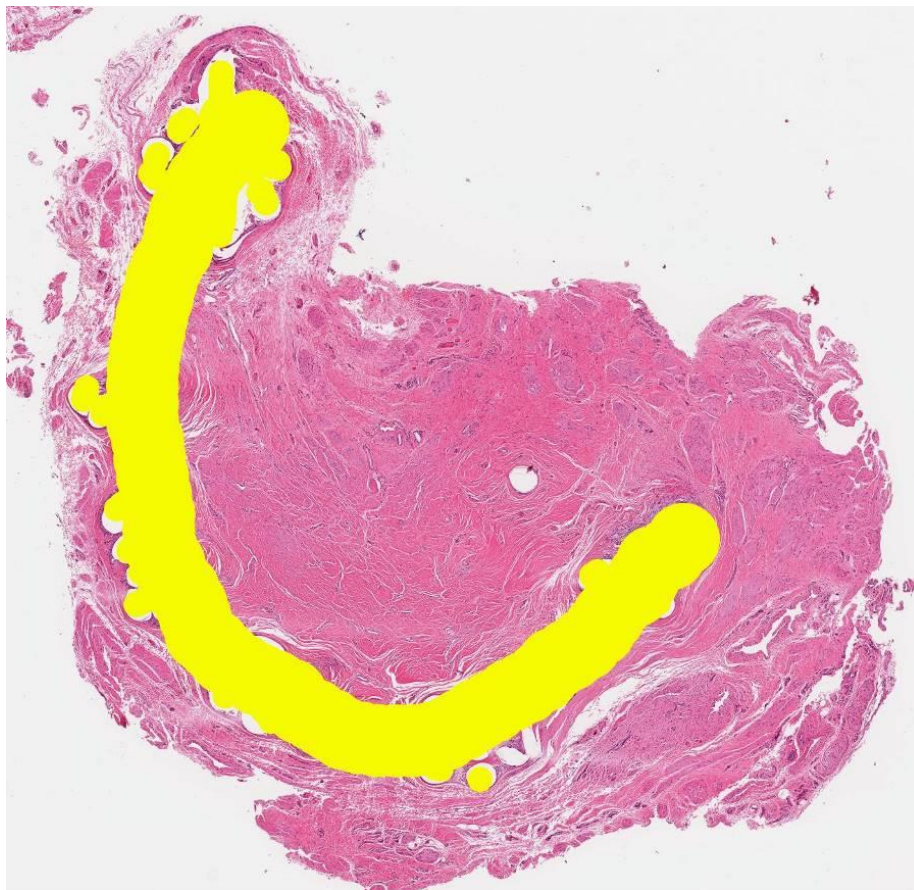


Figure RR4b. Mesh incorporated by scar tissue in a curled/rolled configuration, H&E, magnification equivalent to 4x objective.

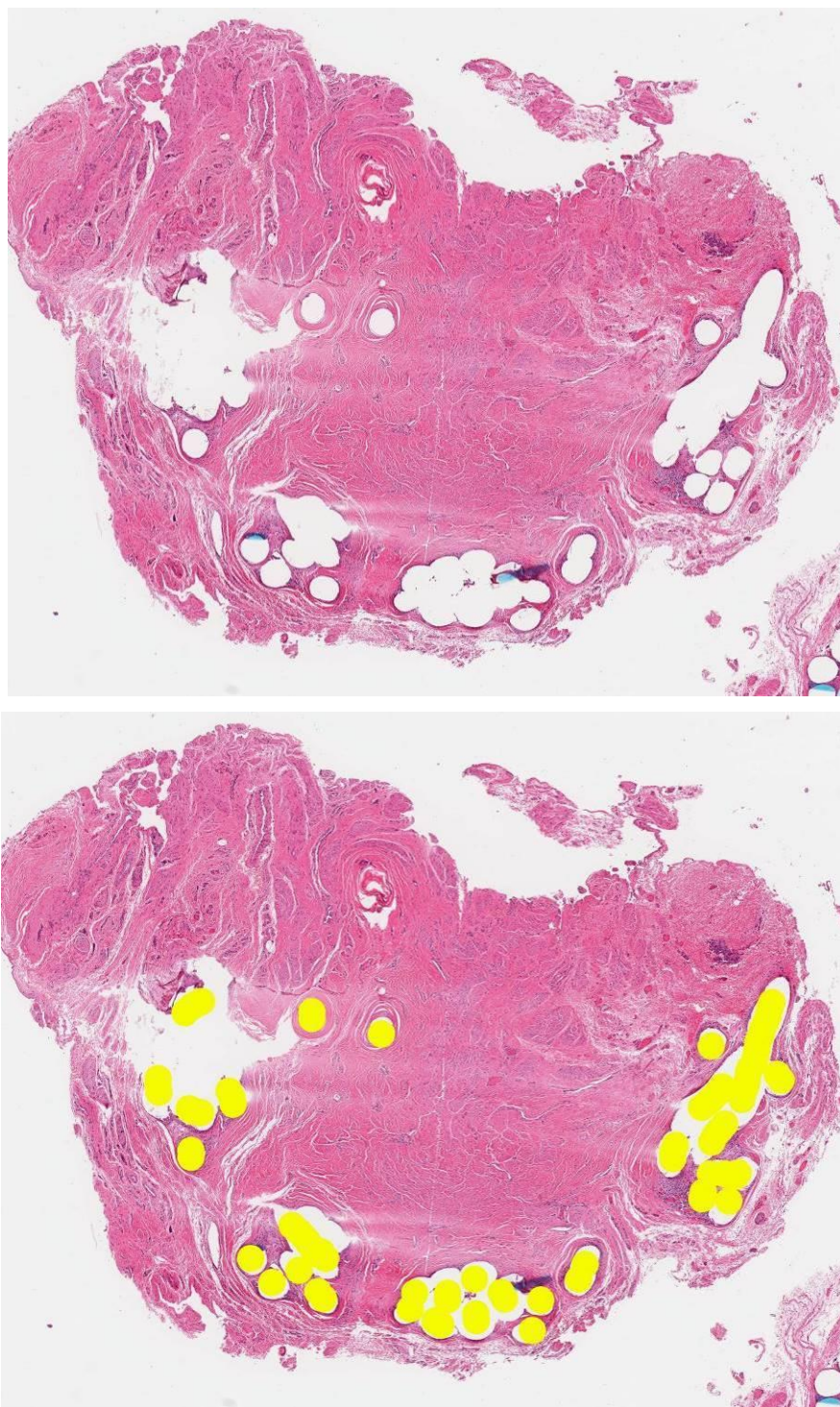


Figure RR5a. Mesh incorporated by scar tissue in a curled/rolled configuration, H&E, magnification equivalent to 4x objective.



Figure RR5b. Mesh incorporated by scar tissue in a curled/rolled configuration, H&E, magnification equivalent to 4x objective.

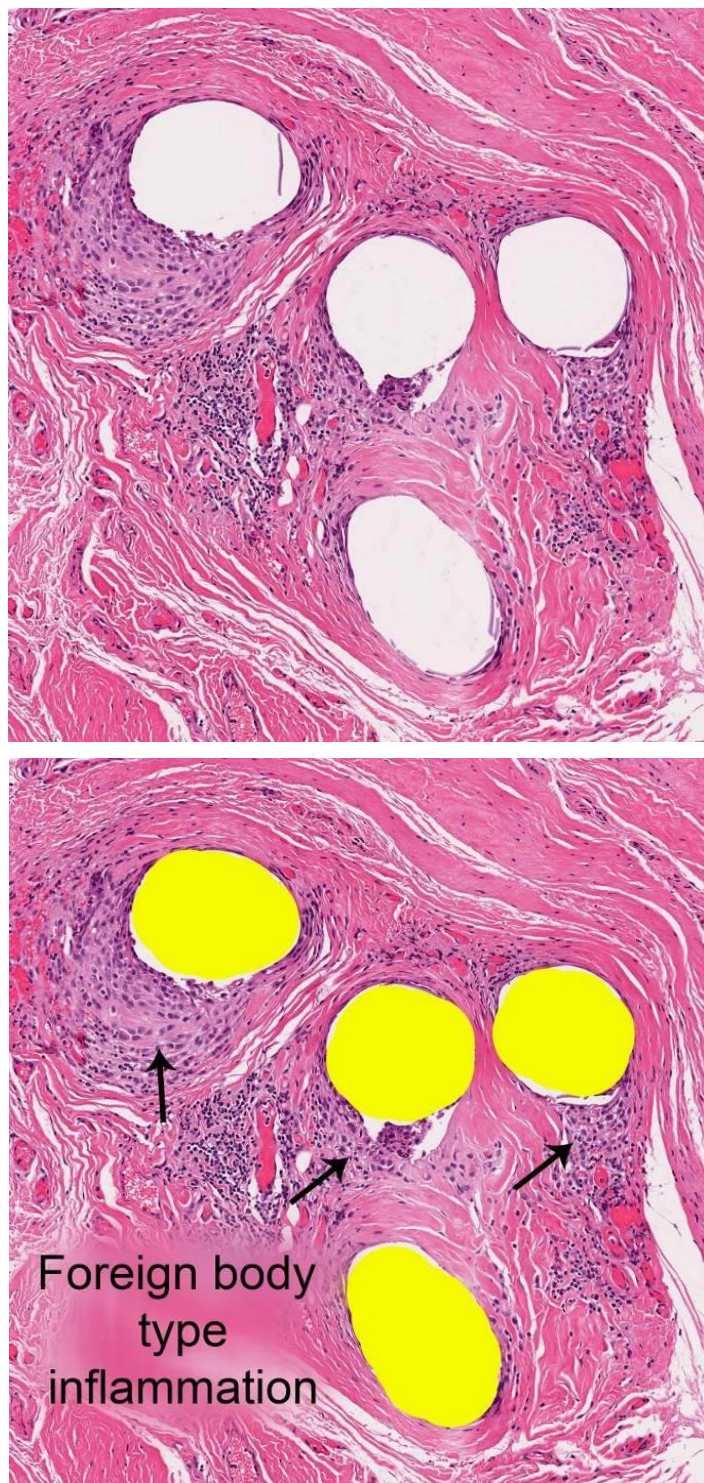


Figure RR6. Foreign body type inflammation against the mesh fibers, H&E, magnification equivalent to 20x objective.

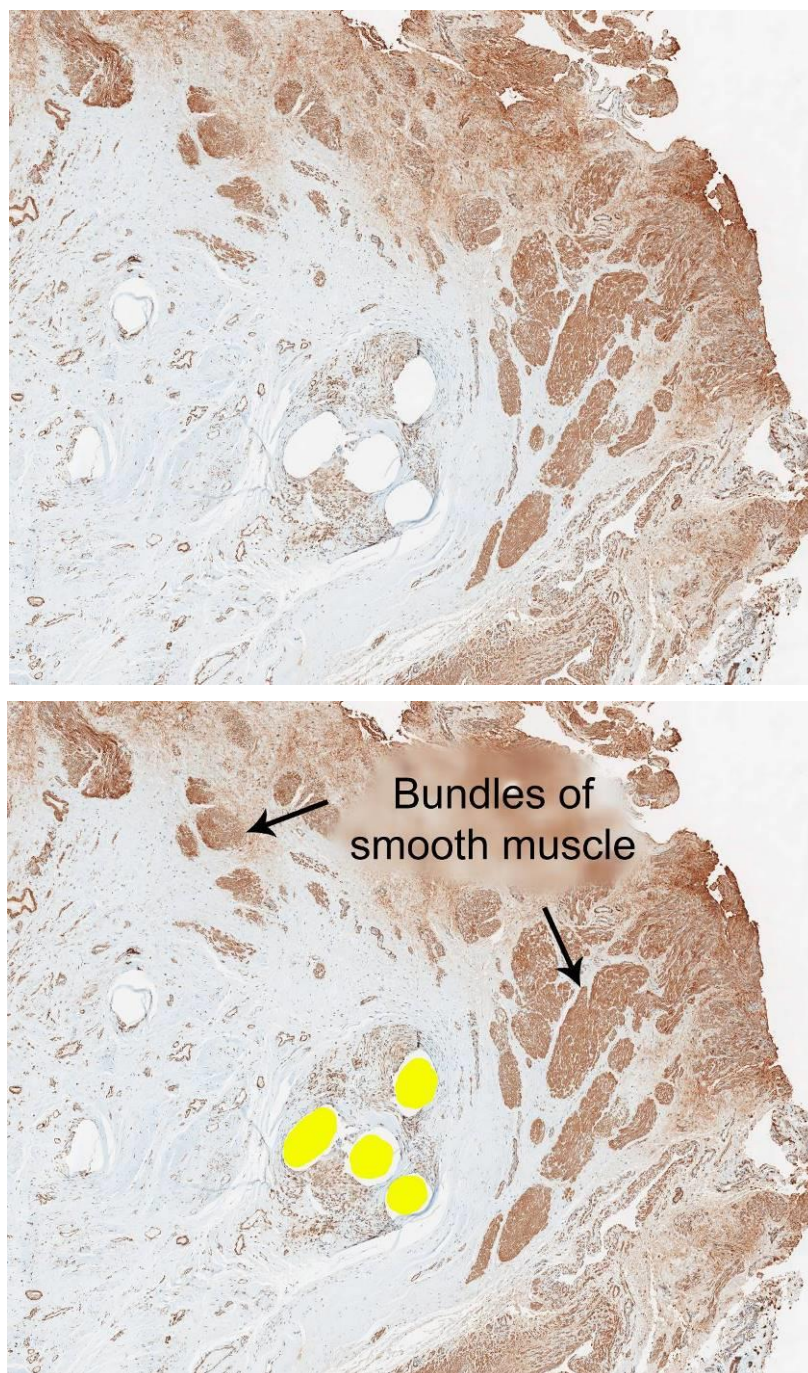


Figure RR7. Mesh migration into the muscular layer of the urethra, smooth muscle actin, magnification equivalent to 4x objective.

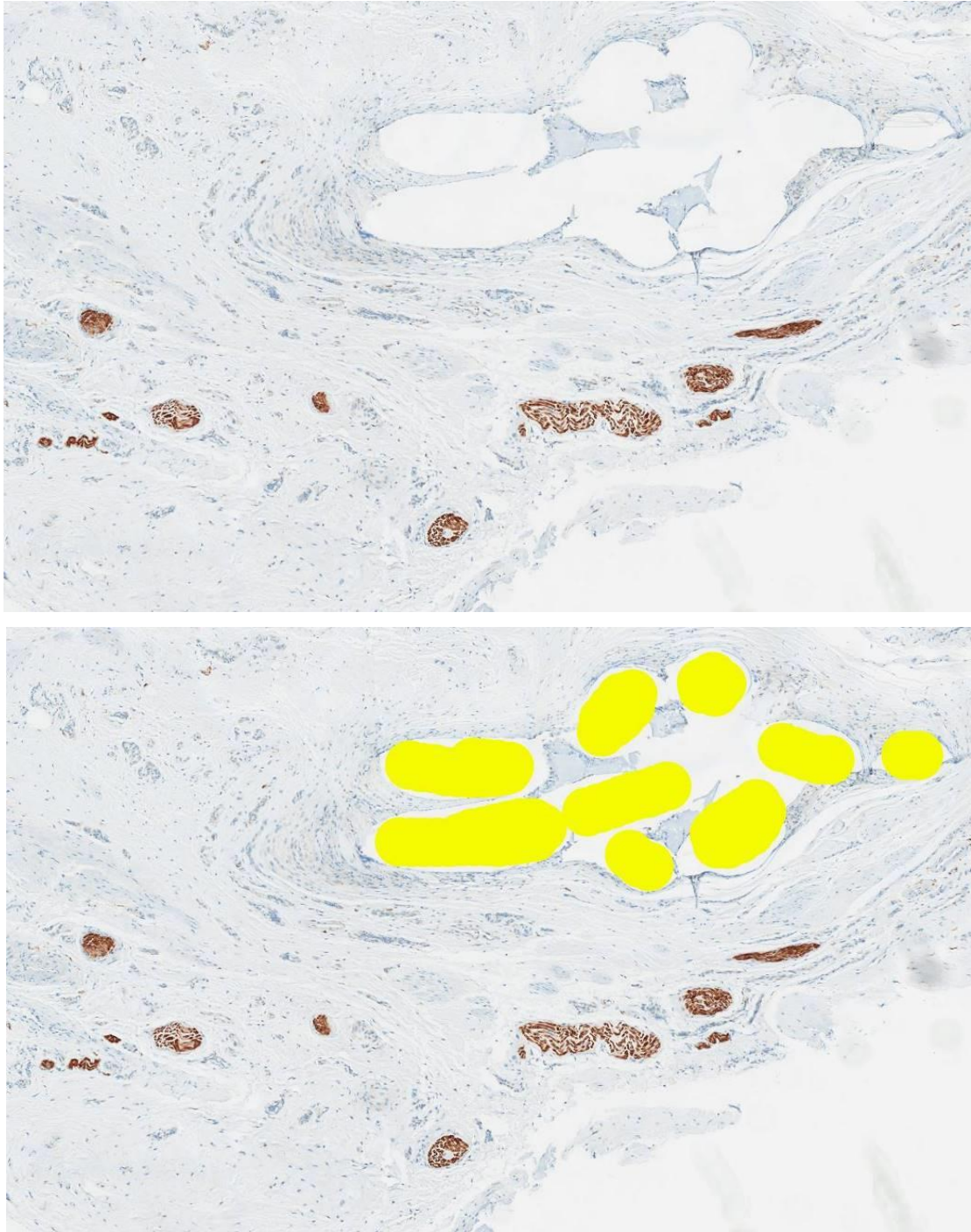


Figure RR8. Innervation of the scar plate, S100, magnification equivalent to 10x objective

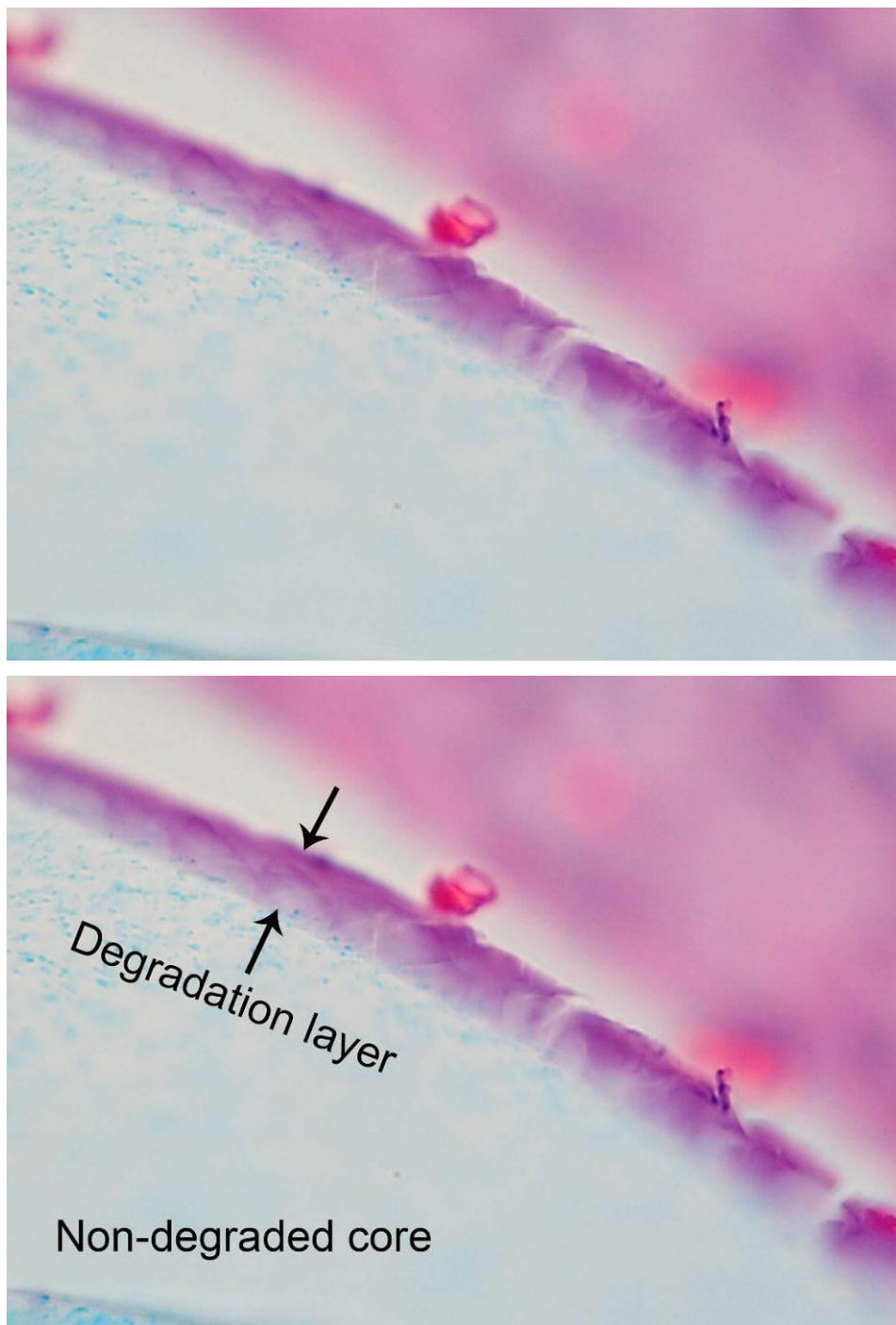


Figure RR9a. Layer of degraded polypropylene shown in regular (above) and polarized light (next page), H&E, 100x objective.

The degradation bark stains purple in H&E stain while the non-degraded core remains clear. Note that the premanufactured blue granules are retained in the degraded layer.

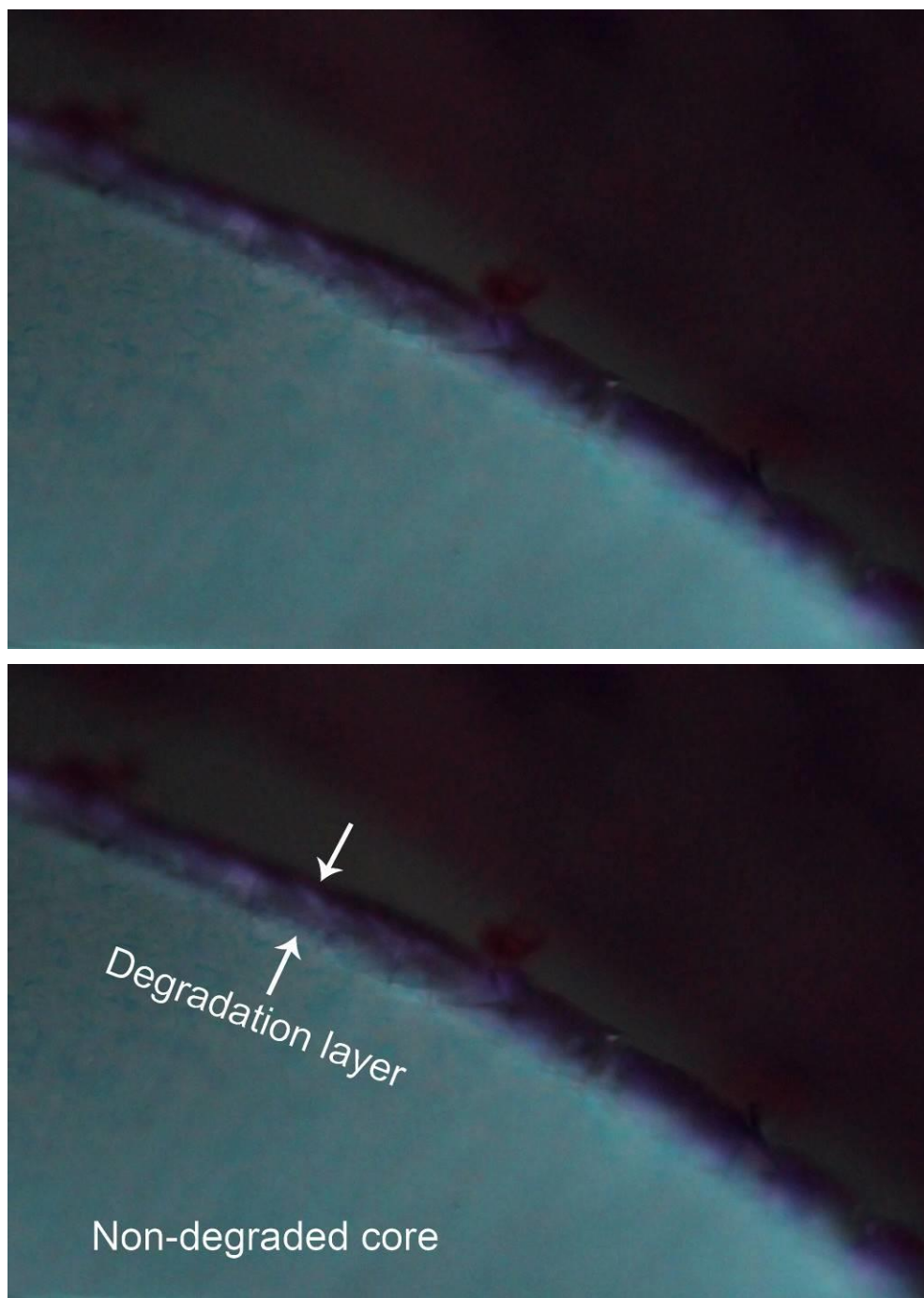


Figure RR9b. Layer of degraded polypropylene shown in polarized light (the same field as in RR9a),
H&E, 100x objective.

In polarized light both, the degraded and non-degraded polypropylene are birefringent (bright). Note the difference with the surrounding tissue.

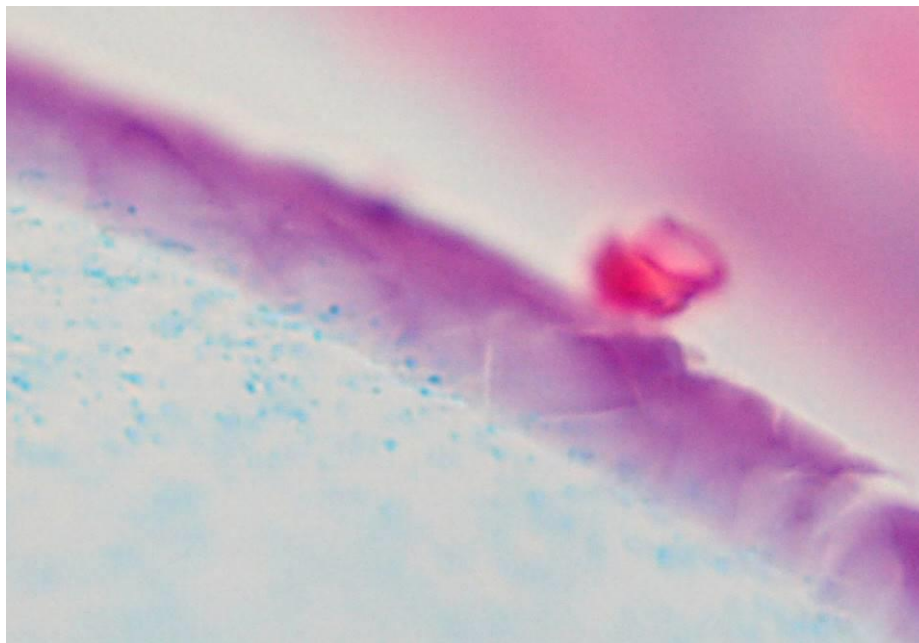


Figure RR10. Enlargement of RR9a.

Note that the premanufactured blue granules are retained in the degraded layer. The granules serve as an internal marker of polypropylene.

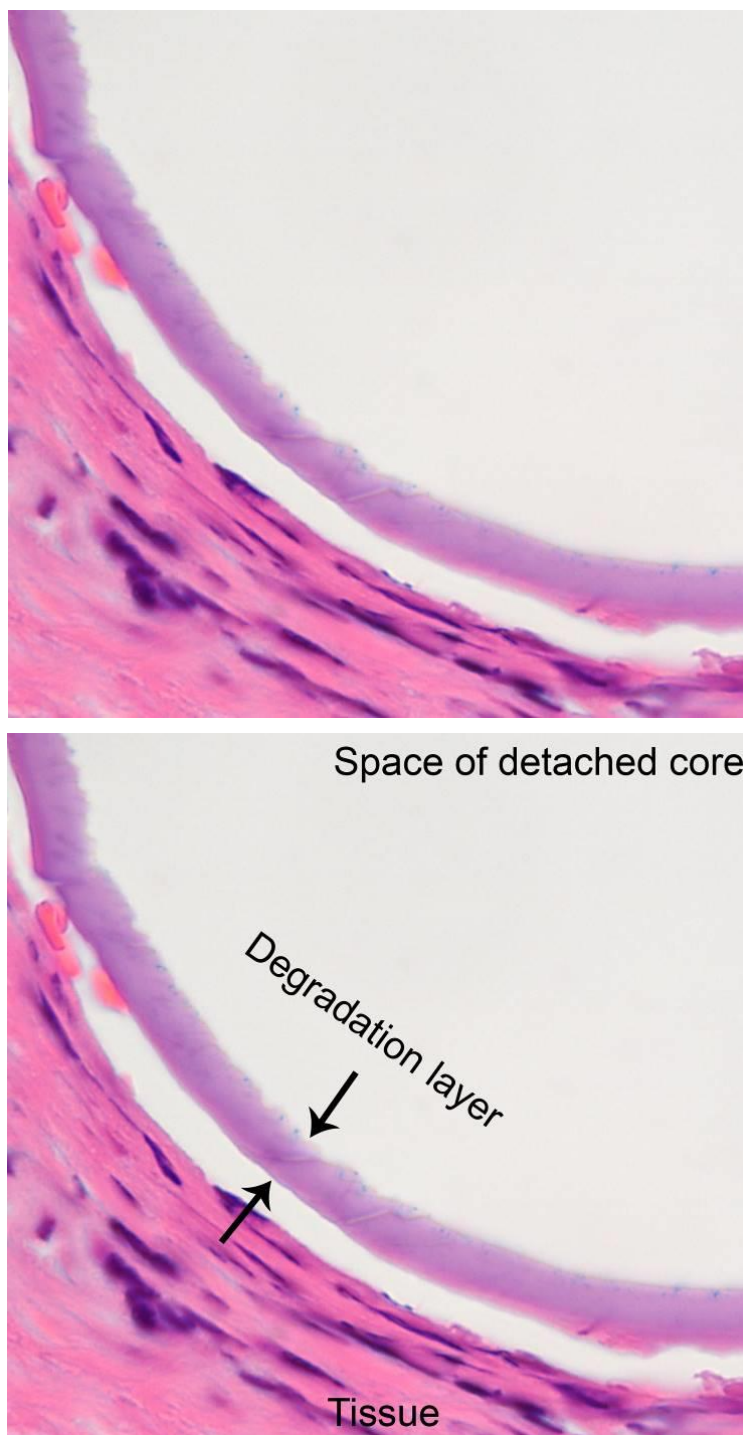


Figure RR11a. Degraded layer separated from the core in regular (above) and polarized light (next page),
H&E, 100x objective.

In this field the non-degraded core detached from the slide during cutting and staining while a segment of the degradation layer remained attached to the tissue.

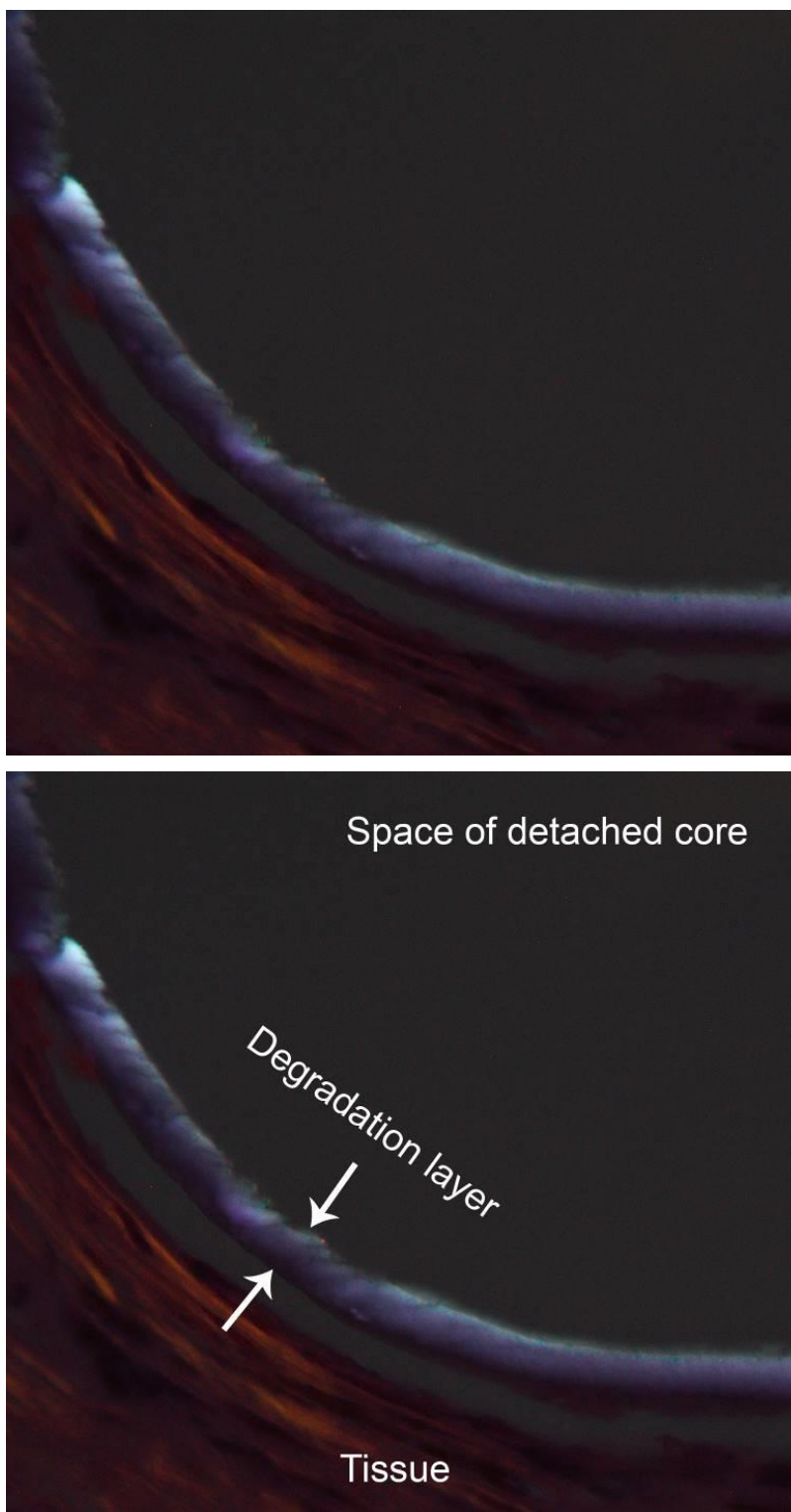


Figure RR11b. Layer of degraded polypropylene shown in polarized light (the same field as in RR11a),
H&E, 100x objective.

In this field birefringence (brightness) of the bark cannot be attributed to light scatter from the core.

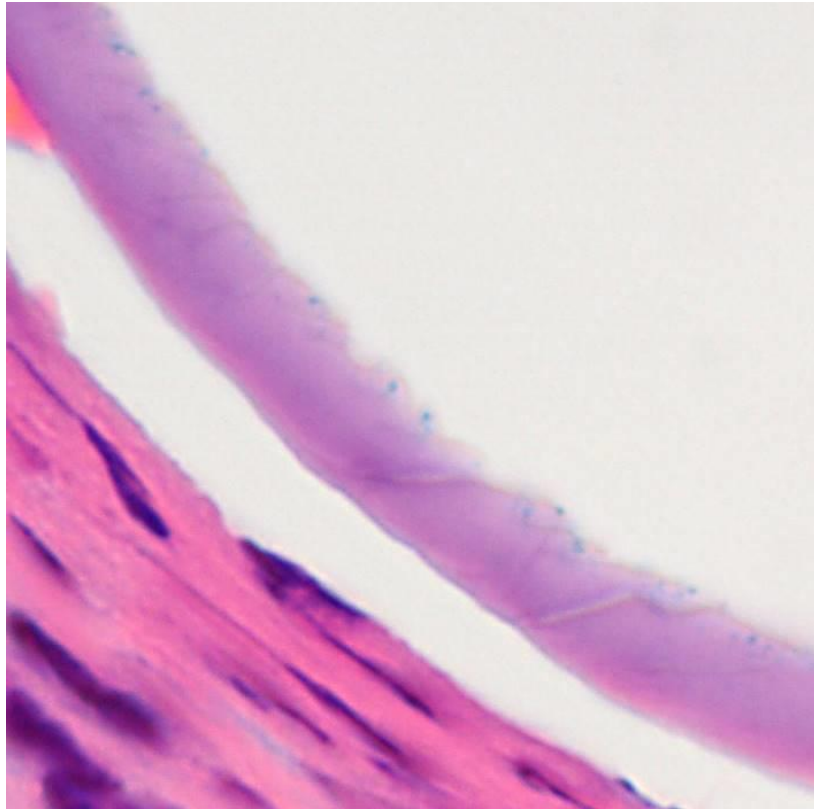


Figure RR12. Enlargement of RR11a.

In this field presence of the blue granules cannot be attributed to an overlap with the core.

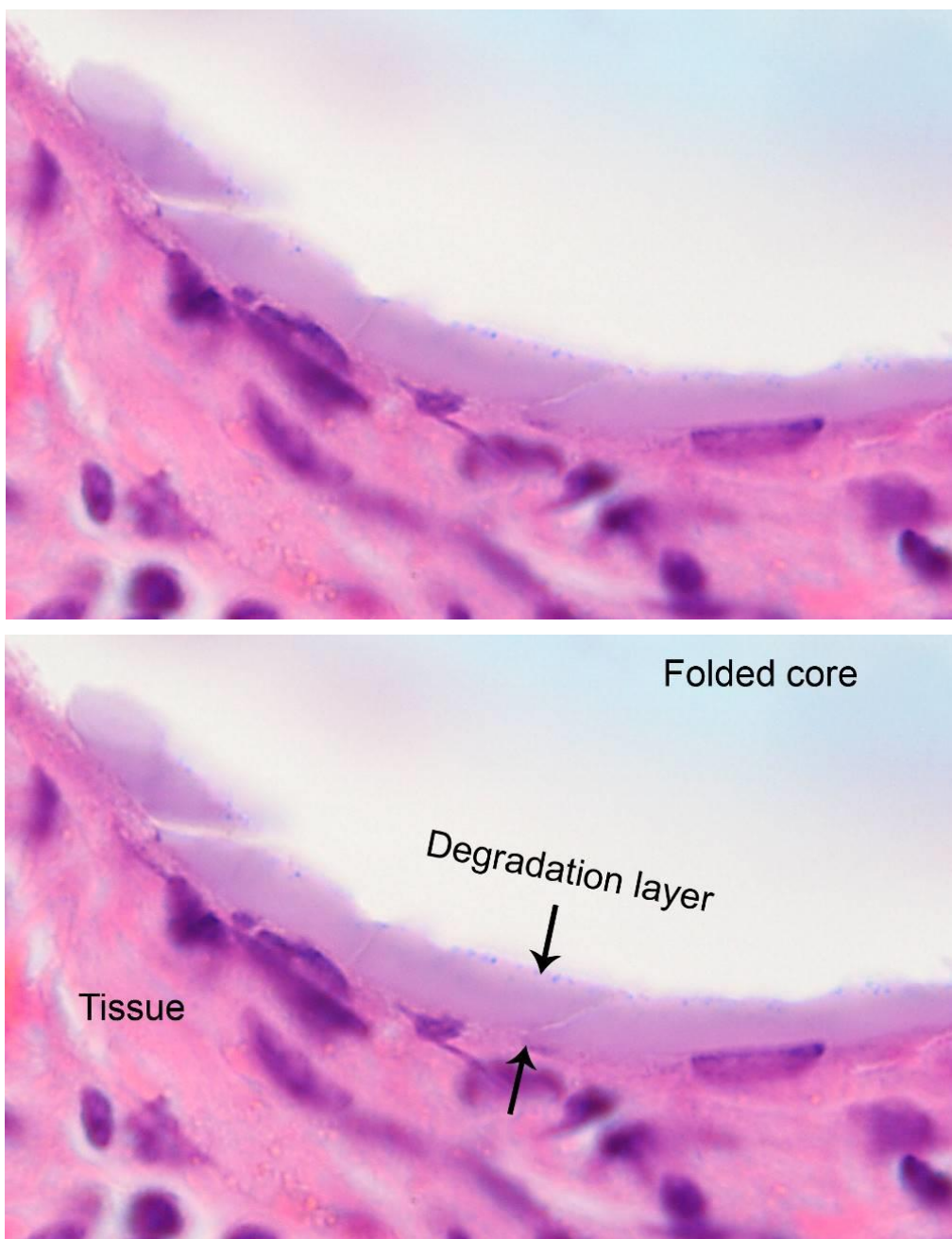


Figure RR13a. Degraded layer separated from the core in regular (above) and polarized light (next page), H&E, 100x objective.

In this field the non-degraded core detached from the slide during staining while segments of the bark stayed attached to the tissue. Presence of the blue granules in this fragment cannot be attributed to an overlap with the core.

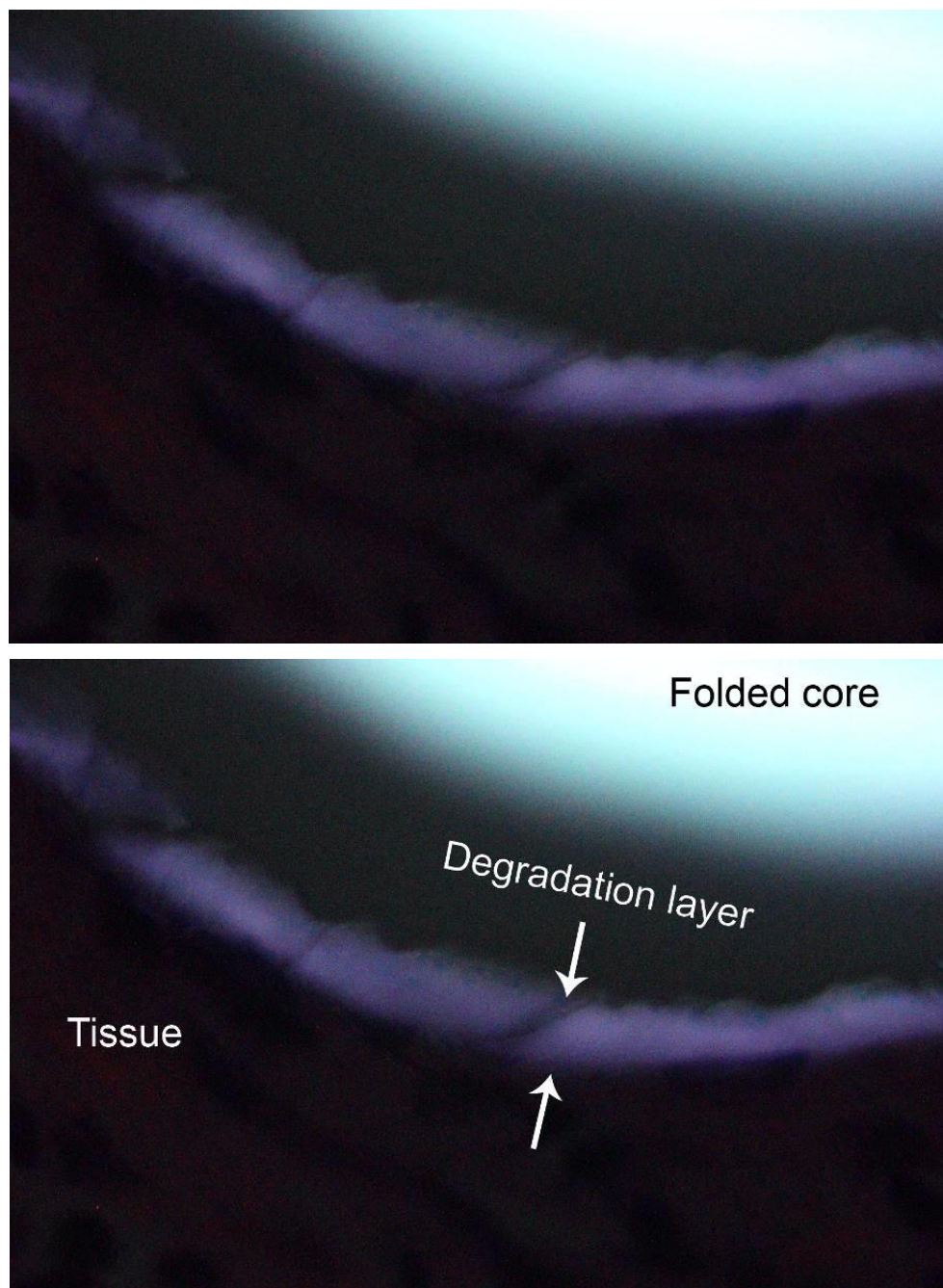


Figure RR13b. Layer of degraded polypropylene shown in polarized light (the same field as in RR13a),
H&E, 100x objective.

In this field birefringence (brightness) of the bark cannot be attributed to light scatter from the core.

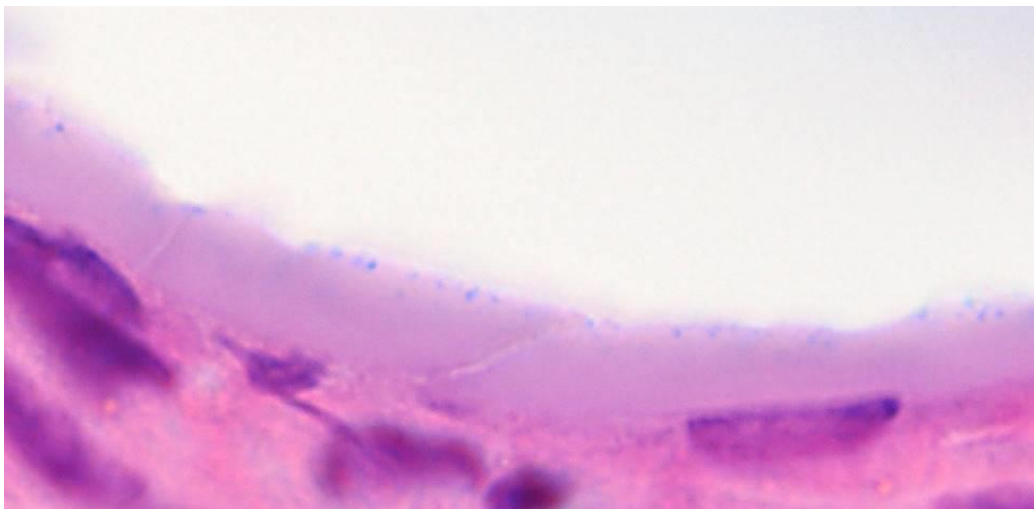


Figure RR14. Enlargement of RR13a.

In this field presence of the blue granules cannot be attributed to an overlap with the core

EXHIBIT A

Curriculum Vitae

Vladimir Iakovlev
MD, FRCPC, FCAP

A. Date Curriculum Vitae is Prepared: 2015 December 9

B. Biographical Information

Primary Office	St. Michael's Hospital, Division of Pathology 30 Bond St., Cardinal Carter, Room 2-093 Toronto, Ontario, Canada M5B1W8
Telephone	416-864-6060#3176
Cellphone	647-6801500
Email	iakovlev.v@gmail.com

1. EDUCATION

Degrees

1986 - 1994	MD, Medicine, Tyumen State Medical Institute (Academy), Tyumen, Tyumenskaya oblast', Russian Federation
-------------	---

Postgraduate, Research and Specialty Training

2005 Jul - 2007 Oct	Fellow, Translational oncologic pathology fellowship program, Canadian Institutes of Health Research Molecular Oncological Pathology program, Ontario Cancer Institute/Princess Margaret Hospital, Toronto, Ontario, Canada, Supervisor(s): Dr. Susan Done, Dr. David Hedley
2001 Jul - 2005 Jul	Anatomic Pathology resident, Anatomic Pathology, Royal College of Physicians of Canada and American Board of Pathology accredited program, The University of Manitoba, Winnipeg, Manitoba, Canada
2000 Jul - 2001 Apr	Observer, Anatomic Pathology, Pathology Department, Sunnybrook and Women's College Health Sciences Centre, Toronto, Ontario, Canada, Supervisor(s): Dr. Linda Kapusta

Qualifications, Certifications and Licenses

2015	Quality Assurance Peer Assessment, Anatomical Pathology, College of Physicians and Surgeons of Ontario, Ontario, Canada
2015	Maintenance of Certification Re-Certification, Anatomical Pathology, American Board of Pathology, United States
2007 - present	Independent Practice (Medical Licensure), College of Physicians and Surgeons of Ontario, Ontario, Canada
2006 - present	Full Unrestricted License (Medical Licensure), Michigan Board of Medicine, Michigan, United States
2006 - present	Fellow, Anatomical Pathology, Royal College of Physicians and Surgeons of Canada,

Vladimir IAKOVLEV

Canada

2006 Diplomate, Anatomical Pathology, American Board of Pathology, United States
 2002 Medical License USMLE, United States Medical Licensing Exams, United States
 2000 LMCC (Licentiate of the Medical Council of Canada), Medical Council of Canada, Canada
 2000 Certification, Educational Commission for Foreign Medical Graduates (ECFMG), United States

2. EMPLOYMENT

Current Appointments

2012 - present Director of Cytopathology, Pathology, Laboratory Medicine, St. Michael's Hospital, Ontario, Canada
Medical director of cytopathology service. 16000 specimens annual volume, 4 cytotechnologists + 1 clerk, rotating cytotechnologist students from Mitchener Institute program. Sign out by 4 cytopathologists. The service includes one of the largest volumes of pancreato-biliary cytology in Canada. Also includes on-site assessment for transbronchial FNAs.

2008 - present Assistant Professor, Laboratory Medicine and Pathobiology, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada

2007 - present Anatomical Pathologist, Division of Pathology, Laboratory Medicine, St. Michael's Hospital, Toronto, Ontario, Canada
Anatomical pathology and cytology at a tertiary teaching hospital.

Previous Appointments

CLINICAL

1994 - 1997 Physician, Tyumen Rehabilitation Center, Tyumen, Tyumenskaya oblast', Russian Federation
Amputee and musculo-skeletal outpatients.

HOSPITAL

1997 - 2001 Prosthetic Technician, SCIL, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada
Fabrication and fitting of artificial limbs

UNIVERSITY

1986 - 1992 Part-time dissector, Tyumen, Tyumenskaya oblast', Russian Federation
To prepare cadavers for teaching and testing of medical students in anatomy, as well as federal exams. Several preparations were placed in the anatomical museum.

UNIVERSITY - RANK

2007 - 2008 Lecturer, Laboratory Medicine and Pathobiology, Faculty of Medicine, University of Toronto, Ontario, Canada

WORK INTERRUPTIONS

1987 Jul - 1989 May Military service, Russian Army, Russian Federation
Mandatory military service. Graphic and map design and drawing, Sargeant School

Vladimir IAKOVLEV

3. HONOURS AND CAREER AWARDS

Distinctions and Research Awards

LOCAL

Received

2008 - 2013 **Dean's Fund award**, University of Toronto, Toronto, Ontario, Canada. (Research Award)
Total Amount: 10,000 CAD

1986 - 1992 **Stipend for high academic results**, Tyumen Medical academy. (Distinction)
6 times during the course of studies.

4. PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Professional Associations

2007 - present **Member**, Canadian Association of Pathologists

2006 - present **Fellow**, College of American Pathologists

2001 - present **Member**, Canadian Medical Protective Association

2007 - 2010 **Fellow**, American Society for Clinical Pathology

2006 - 2011 **Associate member**, American Association for Cancer Research

2002 - 2011 **Member**, United States and Canadian Academy of Pathology

Administrative Activities

INTERNATIONAL

XII International Conference on Obstetrics and Gynecology

2014 Sep 26 - 2014 Sep 27 **Chair**, Open paper and e-poster session, London, United Kingdom.
Co-chair open paper and e-poster session.

PROVINCIAL / REGIONAL

Professional Association of Residents and Interns of Manitoba (PARIM)

2002 - 2004 **Board member**, Winnipeg, Manitoba, Canada.

LOCAL

St. Michael's Hospital

2013 Oct - present **Supervisor**, Digital Pathology, Toronto, Ontario, Canada.
Management of digital pathology.

St. Michael's Hospital

2012 - present **Director**, Cytopathology, Toronto, Ontario, Canada.
Director of Cytopathology.

2008 - present **Pathologist scheduling**, Division of Pathology scheduling, Toronto, Ontario, Canada.
Scheduling and workload distribution.

2010 - 2013 **Chair**, Quality of Care committee, Department of Laboratory Medicine, Toronto, Ontario,

Vladimir IAKOVLEV

Canada.
Chair.

The University of Manitoba

2004 - 2005

Trainee Member, Promotion committee, Pathology department, Faculty of Medicine, Pathology, Multilevel Education, Winnipeg, Manitoba, Canada.
Trainee member.

2003 - 2005

chief resident, Anatomic Pathology residency program, Faculty of Medicine, Pathology, Postgraduate MD, Winnipeg, Manitoba, Canada.
Chief Resident.

Tyumen Medical Institute

1986 - 1987

Medical student representative, Medical Professional Union, Tyumen, Russian Federation.
Union representative of a group.

University of Toronto

2010 - present

Member, Committee for Undergraduate Medical Education, Faculty of Medicine, Dept of Lab. Medicine & Pathobiology, Undergraduate MD, Toronto, Ontario, Canada.
Member from St. Michael's Hospital.

Peer Review Activities

MANUSCRIPT REVIEWS

Reviewer

2013 - present

Artificial Intelligence in Medicine

2012 - present

Annals of Oncology

PRESENTATION REVIEWS

Member

2014 Sep 26 - 2014 Sep 27 XII International Conference on Obstetrics and Gynecology, Open paper and e-poster session

Other Research and Professional Activities

RESEARCH PROJECT

2014 - present

Co-principal investigator. Pathological changes of vas deferens affected by surgical polypropylene mesh. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. Bendavid, Shouldice Hospital, Canada; Dr. Andreas Koch, Germany.
Study of the effect of polypropylene meshes used in hernia repair on vas deferens and other structures of the spermatic cord. The role of the changes in the development of dysejaculation and other symptoms.

2014 - present

Collaborator. Clinical Study of ex vivo Photoacoustic Imaging in Endoscopic Mucosal Resection Tissues. Collaborator(s): Liang Lim, Catherine J. Streutker, Norman Marcon, Maria Cirocco, Ralph DaCosta, F. Stuart Foster and Brian C.

2013 - present

Principal investigator. Pathological findings within explanted surgical polypropylene mesh. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. R. Bendavid, Shouldice Hospital, Canada; Dr. G. Iakovleva, Markham Stouffville Hospital, Canada.
Standardized assessment of explanted surgical meshes and correlation of the morphological

Vladimir IAKOVLEV

findings with complications triggering excision. Histological assessment includes 3-dimensional approach.

- 2013 - present **Principal investigator.** Detection of in vivo polypropylene degradation by histological methods. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. R. Bendavid, Shouldice Hospital, Canada; Dr. S. Guelcher, Vanderbilt University, USA.
Analysis of explanted surgical meshes by light and transmission electron microscopy methods.
- 2013 - present **Co-principal investigator.** Clinical significance of pathology of explanted transvaginal devices. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. John F. Steege, University of North Carolina, USA; Dr. J. Blaivas, Weill Cornell Medical College, USA.
Research collaborations with clinical experts. Correlation between clinical presentation and pathological findings in explanted transvaginal mesh devices.
- 2013 - present **Collaborator.** Spectral analysis for the detection of in vivo degradation of polypropylene. Vanderbilt University, USA, Nashville, Tennessee, United States. Collaborator(s): Dr. S. Guelcher, Vanderbilt University, USA.
Spectral analysis of explanted and virgin polypropylene meshes.
- 2013 - present **Co-principal investigator.** Nerve density and pain in knitted polypropylene meshes explanted after hernia repair. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. Bendavid, Shouldice Hospital, Toronto, Canada.
Analysis of nerve density in meshes explanted for pain vs. hernia recurrence without pain.
- 2005 - present **Research Fellow, later collaborator.** Genomic data analysis. Ontario Cancer Institute/Princess Margaret Hospital, Toronto, Ontario, Canada. Supervisor(s): Dr. Susan Done, clinician-scientist, breast pathologist
Identification of genomic alterations in breast cancer. Detection of circulating tumor cells by molecular techniques.
- 2014 - 2015 Jan **Collaborator.** On the fate of implanted surgical mesh. Weill Cornell Medical College, USA, New York, New York, United States. Collaborator(s): Dr. J. Blaivas, Weill Cornell Medical College.
Analysis of published literature on the topic of prosthetic devices used for treatment of stress urinary incontinence.
- 2012 - 2013 **Co-principal investigator.** Assessment of nerve density and ingrowth in explanted surgical hernia meshes. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. R. Bendavid, Shouldice Hospital, Toronto.
Comparative assessment of explanted hernia meshes, scar without mesh and normal tissue of initial repair.
- 2007 - 2012 **Collaborator.** Assessment of microvascular density and related biomarkers in renal cell carcinoma. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. George Yousef, University of Toronto, Canada.
Assessment of microvascular density and expression structural proteins of older and newer vessels using semi-automated image analysis and variable internal controls.
- 2007 - 2012 **Collaborator.** Genomic analysis of renal cell carcinoma. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. George Yousef, University of Toronto, Canada.
Analysis of array CGH data of renal cell carcinoma samples.
- 2006 - 2012 **Collaborator.** Expression of kallikrein-related peptidase 7 in pancreatic ductal adenocarcinoma. St. Michael's Hospital, Toronto, Ontario, Canada. Collaborator(s): Dr. Randy Haun, University of Arkansas, USA.
Analysis of expression of KLK-7 in tissue microarrays and full sections using semi-automated image analysis.
- 2005 - 2007 **Research Fellow.** Assessment of Carbonic Anhydrase expression in cervical carcinoma and correlation with in-vivo measurements of tissue oxygenation. Ontario Cancer Institute/Princess Margaret Hospital, Toronto, Ontario, Canada. Supervisor(s): Dr. David Hedley, clinician-scientist, medical oncologist
Assessment of Carbonic Anhydrase expression in histological section of patient biopsies, assessment of sampling error, development of sampling protocol and image analysis.

Vladimir IAKOVLEV

- 2004 **resident.** Morphometric analysis of spindle cell neoplasms. The University of Manitoba, Winnipeg, Manitoba, Canada. Supervisor(s): Dr. G. Quinonez
Resident research project. Morphometry of cellular structures of spindle cell neoplasms using transmission electron microscopy.
- 1993 - 1995 **Intern.** Fusion of bone tissues with porous and shape memory titanium alloys. Tyumen State Medical Institute (Academy), Tyumen, Tyumenskaya oblast', Russian Federation.
Supervisor(s): Dr. Durov
Orthopaedic internship research project. Animal experiments for spondylodesis using porous metal alloys and shape memory titanium alloy devices.
- 1989 - 1990 WBC differential changes during menstrual cycle. Tyumen State Medical Institute (Academy), Tyumen, Russian Federation
Year 4 summer project.

C. Research Funding

1. GRANTS, CONTRACTS AND CLINICAL TRIALS

PEER-REVIEWED GRANTS

FUNDED

- 2009 - 2012 **Co-Investigator.** The molecular Basis Behind Invasion of DCIS. Canadian Breast Cancer Foundation (CBCF). Ontario Chapter Operating Grant. PI: Done, Susan. 446,860 CAD. [Grants]
The study aims to detect genomic alterations leading to invasive transition.
- 2008 - 2009 **Co-Investigator.** Genomic Heterogeneity in DCIS. Weekend Walker Breast Cancer Innovation Fund. PI: Done, Susan. 84,655 CAD. [Grants]
Study aimed to identify markers of early invasion to detect circulating tumor cells.

NON-PEER-REVIEWED GRANTS

FUNDED

- 2008 - 2013 **Principal Investigator.** The use of aCGH to detect intratumoural genomic heterogeneity as a predictor of malignant potential of fibroepithelial tumours of the breast. Dean's Fund.
Collaborator(s): Dr. Susan Done. 10,000 CAD. [Grants]
Project to test if intratumoral genomic heterogeneity can be detected by aCGH and correlate with tumor aggressiveness.

Vladimir IAKOVLEV

D. Publications

1. PEER-REVIEWED PUBLICATIONS

Journal Articles

1. Bendavid R, Lou W, Grischkan D, Koch A, Petersen K, Morrison J, **Iakovlev V**. A mechanism of mesh-related post-herniorrhaphy neuralgia. *Hernia*. 2015 Nov 23. [Epub ahead of print] **Principal Author**.
2. V. **V. Iakovlev**, S. A. Guelcher, R. Bendavid. In vivo degradation of polypropylene: microscopic analysis of meshes explanted from patients. 2015. *Journal of Biomedical Materials Research part B: Applied Biomaterials*. Online advanced publication. **Principal Author**.
3. J Blaivas, R Purohit, M Benedon, G Mekel, M Stern, M Billah, K Olugbade, R Bendavid, and **V Iakovlev**. Safety considerations for synthetic sling surgery. 2015. *Nature Reviews Urology*, Online advanced publication. **Co-Principal Author**.
4. Carrigan S, Grin A, Al-Haddad S, **Iakovlev V**, Streutker C, Moore T, Karamchandani J. Emphysematous esophagitis associated with *Sarcina* organisms in a patient receiving anti-inflammatory therapy. *Histopathology*. 2014;Epub ahead of print]. **Coauthor or Collaborator**.
5. **V. Iakovlev**, E. Carey, J, Steege. Pathology of Explanted Transvaginal Meshes. *International Journal of Medical, Health, Pharmaceutical and Biomedical Engineering*. 2014;8(9):510-13. **Principal Author**.
6. Bendavid, R., Lou, W. , Koch, A., **Iakovlev, V**. Mesh-Related SIN Syndrome. A Surreptitious Irreversible Neuralgia and Its Morphologic Background in the Etiology of Post-Herniorrhaphy Pain. *International Journal of Clinical Medicine*. 2014;5:799-810. **Co-Principal Author**.
7. G. Iakovleva, **V. Iakovlev**, M. Ordon, J. Srigley, G. Yousef. Tubulocystic carcinoma of kidney: a distinct entity with challenging diagnosis. *Histopathology*. 2014;Epub ahead of print. **Co-Principal Author**.
8. EVIakovlev, **V Iakovlev**. Facial Baroparesis: a Critical Differential Diagnosis for SCUBA Diving Accidents. *Undersea Hyperbaric Medicine*. 2014;41(5):407-9. 2014. **Senior Responsible Author**.
9. Cawthorn TR, Moreno JC, Dharsee M, Tran-Thanh D, Ackloo S, Zhu PH, Sardana G, Chen J, Kupchak P, Jacks LM, Miller NA, Youngson BJ, **Iakovlev V**, Guidos CJ, Vallis KA, Evans KR, McCready D, Leong WL, Done SJ. Proteomic Analyses Reveal High Expression of Decorin and Endoplasmic (HSP90B1) Are Associated with Breast Cancer Metastasis and Decreased Survival. *PLoS One*. 2012, 7(2):e30992. **Coauthor or Collaborator**.
10. N. Arneson, J. Moreno, **V. Iakovlev**, A. Ghazani, K. Warren, D. McCready, I. Jurisica, and S. J. Done. Comparison of Whole Genome Amplification Methods for Analysis of DNA Extracted from Microdissected Early Breast Lesions in Formalin-Fixed Paraffin-Embedded Tissue. *ISRN Oncology*. 2012, 2012:10692. **Co-Principal Author**.
11. **V Iakovlev**, ER Siegel, MS Tsao, RS Haun. Expression of kallikrein-related peptidase 7 predicts poor prognosis in patients with unresectable pancreatic ductal adenocarcinoma. *Cancer Epidemiology Biomarkers & Prevention*. 2012. 21(7):1135-1142. **Principal Author**.
12. ZW Chen, AM Mulligan, P Henry, **V Iakovlev**. Mixed Encapsulated Papillary Carcinoma/Invasive Ductal Carcinoma of the Male Breast with Metastasis to Lymph Node. *Canadian Journal of Pathology*. 2012. 2012, 4(4):118-122. **Senior Responsible Author**.
13. MH Chui, CJ Streutker, AM Mulligan, **V Iakovlev**. Histological and immunohistochemical features to distinguish between adipocyte hyperplasia, atrophy and neoplasia: differential diagnosis of small round adipocytes in Crohn's disease. *Histopathology*. 2012. 2012, 61(5):984-985. **Senior Responsible Author**.
14. Girgis AH, **V Iakovlev**, Beheshti B, Bayani J, Squire JA, Bui A, Mankaruos M, Youssef Y, Khalil B, Khella H, Pasic M, Yousef GM. *Cancer Research*. 2012. 2012, 72(20):5273-5284. **Coauthor or Collaborator**.

Vladimir IAKOVLEV

15. V **V Iakovlev**, M Gabril, W Dubinski, A Scorilas, YM Youssef, H Faragalla, K Kovacs, F Rotondo, S Metias, A Arsanious, A Plotkin, AHF Girgis, CJ Streutker, GM Yousef. Microvascular Density as an Independent Predictor of Clinical Outcome in Renal Cell Carcinoma: an Automated Image Analysis Study. Lab Invest. 2012, 92(1):46-56. **Principal Author.**
16. Dubinski W, Gabril M, **Iakovlev V**, Scorilas A, Youssef YM, Faragalla H, Kovacs K, Rotondo F, Metias S, Arsanious A, Plotkin A, Girgis AH, Streutker CJ, Yousef GM. Assessment of the prognostic significance of endoglin (CD105) in clear cell renal cell carcinoma using automated image analysis. Hum Pathol. 2011;43(7):1037-1043. **Co-Principal Author.**
17. M Sidiropoulos, A Lausman, M Yudin, **V Iakovlev**. Rising Incidence of Syphilis Infection in Canada: A Case Report of Syphilitic Placentitis. Canadian Journal of Pathology. 2010;2(3):19-21. **Senior Responsible Author.**
18. C Wang, **V Iakovlev**, V Wong, S Leung, K Warren, G Iakovleva, N Arneson, M Pintilie, N Miller, B Youngson, D McCready, S Done. Genomic analysis of primary breast cancers and their sentinel and distal lymph node metastases: an aCGH study. Genes, Chromosomes & Cancer. 2009;48(12):1091-101. **Co-Principal Author.**
19. M Pintilie, **V Iakovlev**, A Fyles, D Hedley, M Milosevic, R Hill. Heterogeneity and power in clinical biomarker studies. Journal of Clinical Oncology. 2009;27(9):17-21. **Co-Principal Author.**
20. V **V Iakovlev**, N C R Arneson, V Wong, S Leung, G Iakovleva, C Wang, K Warren, M Pintilie, S J Done. Genomic differences between pure ductal carcinoma in situ of the breast and that associated with invasive disease: a calibrated aCGH study. Clinical Cancer Research. 2008;14(14):4446-54. **Principal Author.**
21. Pham NA, Schwock J, **Iakovlev V**, Pond GR, Hedley DW, Tsao MS. Immunohistochemical analysis of changes in signaling pathway activation downstream of growth factor receptors in pancreatic duct cell carcinogenesis. BMC Cancer. 2008;8(1):43. **Coauthor or Collaborator.**
22. **V Iakovlev**, M Pintilie, A Morrison, A Fyles, R Hill, D Hedley. Effects of distributional heterogeneity on the analysis of tumor hypoxia based on Carbonic Anhydrase IX. Laboratory Investigation. 2007;87:1206-17. Figures prepared by the author were used for the front page of the journal issue. **Principal Author.**
23. C Wang, R Navab, **V Iakovlev**, M-S Tsao, D R McCready, S J Done. Abelson-interactor protein 1 (ABI-1/E3b1) positively regulates breast cancer cell proliferation, migration and invasion. Molecular Cancer Research. 2007;5:1031-9. Figures prepared by the author were used for the front page of the journal issue. **Co-Principal Author.**
24. V **V Iakovlev**, R S Goswami, J Vecchiarelli, N C R Arneson, S J Done. Quantitative detection of circulating epithelial cells by Q-RT-PCR. Breast Cancer Research and Treatment. 2007, 107:145-54. **Co-Principal Author.**
25. N A Pham, A Morrison, J Schwock, S Aviel-Ronen, **V Iakovlev**, M Tsao, J Ho and D Hedley. Quantitative image analysis of immunohistochemical stains using a CMYK color model. Diagnostic Pathology. 2007;2(8):1-10. **Coauthor or Collaborator.**

Abstracts

1. M Thompson, D R. Ostergard, E Carey, S Guelcher, **V Iakovlev**. Court is in Session: Will Transvaginal Mesh Win or Lose? Interactive Seminar. International Urogynecological Association (IUGA), 40th annual meeting. 2015. Programme. **Coauthor or Collaborator.**
2. V. **V. Iakovlev**, S. A. Guelcher, R. Bendavid. Histological Features and Clinical Implications of Polypropylene Degradation. Canadian Journal of Surgery. 2015, 58(4 s2):46. **Principal Author.**
3. **V. Iakovlev**, A. Koch, R. Bendavid. Migration of Polypropylene Mesh in the Development of Late Complications. Canadian Journal of Surgery. 2015. 58(4 s2):46.. **Principal Author.**
4. T. Lin, E. Giles, M. Glick, S. Ketcheson, **V. Iakovlev**, E. Schemitsch, A. Nauth. Augmenting Rotator cuff repair with endothelial progenitor cells. ORS Annual Meeting. 2015. **Coauthor or Collaborator.**
5. **V. Iakovlev**, G. Iakovleva, R. Bendavid. Explanted Surgical Meshes: What Pathologists are Missing? United States and Canadian Academy of Pathology (USCAP), Annual meeting. 2015;28(S2):19A. 63. **Principal Author.**

Vladimir IAKOVLEV

6. **V. Iakovlev**, G. Iakovleva, R. Bendavid. Systematic Pathological Assessment of Explanted Hernia Meshes Reveals Important Information of Mesh-body Interactions. *Hernia*. 2015;19 (S1) P5:04. **Principal Author**.
7. T. E. Chang, K. Warren, R. Nair, T. Y. Lu, A. Adeoye, **V. Iakovlev**, S. J. Done. Genomic alterations in ductal carcinoma in situ compared with Invasive breast cancer: a quantitative real-time PCR study. AACR annual meeting programme 2015. 2015:4747. **Coauthor or Collaborator**.
8. L. Lim, C. Streutker, N. E. Marcon, M. Cirocco, V V. Iakovlev, R. S. DaCosta, G. R. May, S. Foster, B. C. Wilson. Clinical Study of Ex Vivo Photoacoustic Imaging in Endoscopic Mucosal Resection Tissues. *Gastroenterology*. 2015;48(4 (S1)):S-769-S-770. **Coauthor or Collaborator**.
9. V. **V. Iakovlev**, E. T. Carey, G. Iakovleva, J. Steege, R. Bendavid. Pathological findings associated with pain in transvaginal meshes. The 20th World Congress on Controversies in Obstetrics, Gynecology & Infertility (COGI). 2014;programme. **Principal Author**.
10. **Iakovlev V**, Mekel G, Blaivas J. Pathological Findings of Transvaginal Polypropylene Slings explanted for Late Complications: Mesh is Not Inert. International Continence Society (ICS) annual meeting, programme. 2014:228. **Principal Author**.
11. R. F. Dunn, S. A. Guelcher, **V. Iakovlev**. Failure Analysis of Transvaginal Mesh Products – a Biomaterials Perspective Using Materials Science Fundamentals. AICHE Annual Meeting. 2014:112f. **Co-Principal Author**.
12. **V. Iakovlev**. Explanted Surgical Meshes: What Pathologists and Industry Failed to do for 50 Years. *Virchows Archiv*. 2014;463(1):337. **Principal Author**.
13. E. Iakovlev, L. Errett, R. Siddiqui, **V. Iakovlev**. Anterior Mediastinal Cysts and Pericarditis are an Important Differential Diagnosis: a Case report and Literature Analysis. *Virchows Archiv*. 2014;463(1):379. **Senior Responsible Author**.
14. G. Iakovleva, S. Jothy, **V. Iakovlev**. Malakoplakia of Transplanted Kidney: Mimiker of Neoplasia. *Virchows Archiv*. 2014;463(1):157. **Senior Responsible Author**.
15. E. Iakovlev, L. Errett, **V. Iakovlev**. Familial Non-marfan Thoracic Aortic Aneurysms: A Case Report and Literature Analysis. *Virchows Archiv*. 2014;463(1):125. **Senior Responsible Author**.
16. **V. Iakovlev**, S. Guelcher, R. Bendavid. In Vivo Degradation of Surgical Polypropylene Meshes: A Finding Overlooked for Decades. *Virchows Archiv*. 2014;463(1):35. **Principal Author**.
17. T. Lin, **V. Iakovlev**, S. Ketchson, E. Schemitsch, A. Nauth. Augmenting Rotator Cuff Repair Using Endothelial Progenitor Cells. *Virchows Archiv*. 2014;463(1):15. **Co-Principal Author**.
18. F Rotondo, D G Munoz, J Karamchandani, J Bilbao, **V Iakovlev**, M D Cusimano, A Di Ieva, K Kovacs. Intracellular Melanocytic Tumor Mimicking Pituitary Adenoma. Endocrine Society's 96th Annual Meeting and Expo. 2014;SUN-0724. **Coauthor or Collaborator**.
19. CF Li, SJ Bauer, O Pangan, G May, H Ghaffar, **V Iakovlev**, C Streutker, S Jothy. Detection of KRAS Mutations Using COLD-PCR-Enhanced Melting Curve Analysis for the Diagnosis of Pancreatic Cancer in Cytologic Specimens from Endoscopic Ultrasound-Guided Fine-Needle Aspiration. *Journal of Molecular Diagnostics*. 2013;15(6):907. **Coauthor or Collaborator**.
20. J. Moreno, R Nair 1, N. A. Miller, B.J. Youngson, **V. Iakovlev**, M. Pintile, D. McCready, S.J. Done. DCIS Heterogeneity: An integrated RNA-miRNA analysis. *Modern Pathology*. 2012;25(54A). **Coauthor or Collaborator**.
21. W Dubinski, M Gabril, **V Iakovlev**, Y Youssef, K Kovacs, S Metias, F Rotondo, M Moussa, C Streutker, GM Yousef. Automated Image Analysis of Endoglin and Microvascular Density in Clear Cell Renal Cell Carcinoma and Its Prognostic Significance. *Modern Pathology*. 2011;24(1S):189A. **Coauthor or Collaborator**.
22. D Tran-Thanh, D-Y Wang, **V Iakovlev**, C Wang, JC Moreno, S Boerner, N Miller, B Youngson, WL Leong, SJ Done. Mapping Molecular Alterations in Breast Cancer Using Mammary Ductoscopy. *Modern Pathology*. 2011;24(1s):456A. **Coauthor or Collaborator**.

Vladimir IAKOVLEV

23. S Jothy, K Sy, **V Iakovlev**, JS Zaltzman. Mutated Form of Bk Polyomavirus As A Cause of Transitional Cell Carcinoma in A Renal Transplant. Transplantation. 2010;90:705. **Coauthor or Collaborator**.
24. W Dubinski, **V Iakovlev**, M Gabril, Y Youssef, K Kovacs, S Metias, M Mankaruous, GM Yousef. Automated Image Analysis of Microvascular Density in Clear Cell Renal Cell Carcinoma and Its Prognostic Utility. Modern Pathology. 2010;23(Suppl):187A. **Co-Principal Author**.
25. H Faragalla, **V Iakovlev**. Benign symmetric lipomatosis as a late complication to chemotherapy, a case report. Pathology - Research and Practice. 2010;206(3):199, P903. **Senior Responsible Author**.
26. M. Sidiropoulos, A. Lausman, M. Yudin, **V Iakovlev**. Rising incidence of syphilis infection in Canada: a case report of syphilis placentitis. Pathology - Research and Practice. 2010;206(3):210, P955. **Senior Responsible Author**.
27. D Tran-Thanh, **V Iakovlev**, C Wang, V Wong, K Warren, N C Arneson, D McCready, S Boerner, N Miller, B Youngson, W Leong and S J Done. Identification of molecular alterations leading to malignancy in ductoscopically procured mammary epithelial cells. Modern Pathology. 2009;22(1s):96A. **Coauthor or Collaborator**.
28. **V Iakovlev**, N Arneson, V Wong, C Wang, S Leung, G Iakovleva, K Warren, M Pintilie, S Done. Genomic alterations associated with the progression to invasive breast cancer revealed by array comparative genomic hybridization. Virchows Archiv. 2008;452(S1):S286. **Principal Author**.
29. **V V Iakovlev**, A Morrison, R Hill, D Hedley. A method of assessment of sampling error in biological tissues. Pathology - Research and Practice. 2008;204:53. **Principal Author**.
30. **V V Iakovlev**, N C Arneson, C Wang, S J Done. Segments of DNA copy number preferentially altered in invasive breast cancer. Pathology - Research and Practice. 2008;204:31. **Principal Author**.
31. C Wang, VI V Iakovlev, V Wong, S Leung, K Warren, G Iakovleva, N C R Arneson, N Miller, B Youngson, D R McCready, S J Done. Genomic alterations in primary breast cancers and their sentinel lymph node metastases detected by array CGH. AACR annual meeting programme. 2008;2008. **Co-Principal Author**.
32. M Pintilie, **V Iakovlev**, M Milosevic, D Hedley, A Fyles, R P Hill. Heterogeneity and Power in Clinical Marker Studies. . National Cancer Institute. 2008. Advancing Cancer Research Through Biospecimen Science. 2008, programme. 2008;2008. **Co-Principal Author**.
33. D Tran-Thanh, **V Iakovlev**, C Wang, V Wong, K Warren, N C Arneson, W Leong, D McCready, S Boerner and S J Done. Identification of Molecular Alterations leading to Malignancy in Ductoscopically procured Epithelial Cells. AACR annual meeting programme. 2008;2008. **Co-Principal Author**.
34. **V V Iakovlev**, N C Arneson, C Wang, S J Done. Genomic changes of in situ and invasive breast cancer identified by array comparative genomic hybridization. Proceedings of American Association for Cancer Research annual meeting. 2007;2007. **Principal Author**.
35. **V Iakovlev**, M Pintilie, A Morrison, A Fyles, R Hill, D Hedley. The effect of histological tissue sample size on the sampling error. Laboratory Investigation. 2007;87(S1):1-350A. **Principal Author**.
36. **V Iakovlev**, R Goswami, N Arneson, J Vecchiarelli, S J Done. Quantitative detection of circulating epithelial cells. Pathology - Research and Practice. 2006;202:832. **Principal Author**.
37. **V Iakovlev**, A Morrison, M Pintile, R Hill, D Hedley. Quantitative assessment of heterogeneously expressed markers within histological sections. Pathology - Research and Practice. 2006;202:794. **Principal Author**.

Vladimir IAKOVLEV

E. Presentations and Special Lectures

1. INTERNATIONAL

Invited Lectures and Presentations

2015 **Speaker.** What do we know about meshes in human bodies? Bard Davol European Hernia Symposium. Berlin, Germany.

Presentations of Submitted Abstracts

2015 **Speaker.** Court is in Session: Will Transvaginal Mesh Win or Lose? Interactive Seminar. International Urogynecological Association (IUGA), 40th annual meeting. Nice, France

2015 **Speaker.** Systematic Pathological Assessment of Explanted Hernia Meshes Reveals Important Information of Mesh-body Interactions. 1st World Conference on Abdominal Wall Hernia Surgery. Milan, Italy.

2015 **Presenter.** Explanted Surgical Meshes: What Pathologists Are Missing? United States and Canadian Academy of Pathology (USCAP), annual meeting 2015. Boston, United States.

2014 **Presenter.** Pathological Findings of Transvaginal Polypropylene Slings explanted for Late Complications: Mesh is Not Inert. International Continence Society (ICS) annual meeting. Rio de Janeiro, Brazil.

2014 **Speaker.** Pathological findings associated with pain in transvaginal meshes. The 20th World Congress on Controversies in Obstetrics, Gynecology & Infertility (COGI). Paris, France.

2014 **Presenter.** Explanted Surgical Meshes: What Pathologists and Industry Failed to do for 50 Years. 26th European Congress of Pathology. London, United Kingdom.

2014 **Speaker.** Pathology of Explanted Transvaginal Meshes. International Conference on Obstetrics and Gynecology. World Academy of Science, Engineering and Technology. London, United Kingdom.

2014 **Speaker.** In Vivo Degradation of Surgical Polypropylene Meshes: A Finding Overlooked for Decades. 26th European Congress of Pathology. London, United Kingdom.

2014 **Speaker.** Augmenting Rotator Cuff Repair Using Endothelial Progenitor Cells. 26th European Congress of Pathology. London, United Kingdom.

2008 **Speaker.** Genomic alterations associated with the progression to invasive breast cancer revealed by array comparative genomic hybridization. Third Intercontinental congress of pathology. Barcelona, Spain.

2007 **Presenter.** Genomic changes of in situ and invasive breast cancer identified by array comparative genomic hybridization. American Association for Cancer Research annual meeting, 2007. United States.

2. NATIONAL

Invited Lectures and Presentations

2014 **Invited Speaker.** "SIN syndrome" – A New Mechanism for Mesh Inguinodynia. 1st Annual Abdominal Wall Hernia Conference, Canadian Hernia Society. Toronto, Ontario, Canada.

Vladimir IAKOVLEV

Presentations of Submitted Abstracts

- 2015 **Speaker.** Histological Features and Clinical Implications of Polypropylene Degradation. Canadian Surgery Forum, Quebec City, Canada
- 2015 **Speaker.** Migration of Polypropylene Mesh in the Development of Late Complications. Canadian Surgery Forum, Quebec City, Canada
- 2014 **Presenter.** Mesh-Related SIN Syndrome. A Surreptitious Irreversible Neuralgia and Its Morphologic Background in the Etiology of Post-Herniorrhaphy Pain. Association of General Surgeons meeting (2014 Canadian Surgery Forum). Vancouver, British Columbia, Canada.
- 2014 **Speaker.** Canadian Association of General Surgeons meeting (Canadian Surgery Forum). Vancouver, British Columbia, Canada. Presenter(s): SIN syndrome: Pathological Findings in Explanted Mesh Specimens.
- 2009 **Presenter.** Rising incidence of syphilis infection in Canada: a case report of syphilis placentitis. 60th Annual Meeting of the Canadian Association of Pathologists. Canada.
- 2008 **Presenter.** Genomic changes associated with duct carcinoma in situ of the breast: an array comparative genomic hybridization study. Canadian Breast Cancer Research Alliance, fifth scientific conference. Vancouver, British Columbia, Canada.
- 2007 **Presenter.** A method of assessment of sampling error in biological tissues. 58th Annual Meeting of the Canadian Association of Pathologists. Canada.
- 2007 **Speaker.** Segments of DNA copy number preferentially altered in invasive breast cancer. 58th Annual Meeting of the Canadian Association of Pathologists. Canada.
- 2006 **Presenter.** Quantitative detection of circulating epithelial cells. 57th Annual Meeting of the Canadian Association of Pathologists. Canada.
- 2006 **Speaker.** Quantitative assessment of heterogeneously expressed markers within histological sections. 57th Annual Meeting of the Canadian Association of Pathologists. St. John's, Newfoundland and Labrador, Canada.

CME Workshops

- 2014 **Lecturer.** Difficult Diagnoses in Cytology: Pancreatic FNA, Bile Duct Brushings and Lung EBUS. 65th Annual Meeting of the Canadian Association of Pathologists. Toronto, Ontario, Canada.
- 2014 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2013 **Lecturer.** Difficult Diagnoses in Cytology: Pancreatic FNA, Bile Duct Brushings and Lung EBUS. Quebec, Canada. 64th Annual Meeting of the Canadian Association of Pathologists
27th World Congress of the World Association of Societies of Pathology and Laboratory Medicine.
- 2013 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2013 **Lecturer.** Correlation Between EUS/FNA of Pancreas and Resection Specimens. Department of Laboratory Medicine and Pathobiology, University of Toronto. Canada. Pathology Update, CME event for pathologists.
- 2012 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.

Vladimir IAKOVLEV

- 2011 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2010 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2009 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2008 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.
- 2007 **Lecturer.** Bone disease presenting as MSK pain. University of Toronto and St. Michael's Hospital. Ontario, Canada. Advanced Clinician Practitioner in Arthritis Care Program. CME course for physiotherapists.

3. PROVINCIAL / REGIONAL

Invited Lectures and Presentations

- 2015 **Invited Speaker.** Migration of surgical meshes in the body and associated pathological changes. Shouldice Hospital. Richmond Hill, Ontario, Canada.
- 2013 **Invited Speaker.** Pathological findings in explanted surgical meshes. Shouldice Hospital. Richmond Hill, Ontario, Canada.
- 2006 **Invited Speaker.** Sampling error and development of sampling strategies for biological tissues. Fields Institute, University of Toronto. Toronto, Ontario, Canada.

4. LOCAL

Invited Lectures and Presentations

- 2014 **Invited Lecturer.** IgG4 Related Disease. Medical Grand Rounds, St. Michael's Hospital. Toronto, Ontario, Canada.

Presentations of Submitted Abstracts

- 2014 **Presenter.** Pathological Findings of Transvaginal Polypropylene Slings explanted for Late Complications: Mesh is Not Inert. Roderick Ross Research Day, St. Michael's Hospital, Toronto, Canada. Toronto, Ontario, Canada.
- 2008 **Presenter.** Genomic analysis of primary breast cancers and their sentinel and distal lymph node metastases. Roderick Ross Research Day, St. Michael's Hospital. Toronto, Ontario, Canada. Poster presentation.
- 2007 **Presenter.** A method of assessment of sampling error in biological tissues. Roderick Ross Research Day, St. Michael's Hospital. Toronto, Ontario, Canada. Poster presentation.
- 2007 **Presenter.** Genomic changes of in situ and invasive breast cancer identified by array comparative genomic hybridization. Applied Molecular Oncology Division retreat, Ontario Cancer Institute. Toronto,

Vladimir IAKOVLEV

Ontario, Canada. Poster presentation.

- 2007 **Speaker.** Identification of DNA copy number changes in invasive and in situ breast carcinoma. Division of Applied Molecular Oncology seminar, Ontario Cancer Institute/Princess Margaret Hospital. Toronto, Ontario, Canada.
- 2006 **Presenter.** Quantitative detection of circulating epithelial cells by Q-RT-PCR. Research day, University Health Network. Toronto, Ontario, Canada. Poster presentation.
- 2006 **Presenter.** Quantitative detection of circulating epithelial cells. Applied Molecular Oncology Division retreat, Ontario Cancer Institute. Toronto, Ontario, Canada. Poster presentation.
- 2006 **Presenter.** Detection of circulating epithelial cells by CK19 mRNA. Campbell Family Institute of Breast Cancer Research Annual Retreat. Kimberly, Ontario, Canada. Poster presentation.
- 2005 **Speaker.** Analysis of Carbonic Anhydrase IX content within cervical cancer biopsies. Hypoxia Group meeting: 2005, Ontario Cancer Institute. Toronto, Ontario, Canada.
- 2004 **Speaker.** LM and EM morphological pattern correlation of malignant spindle cell neoplasms (a pilot study). Annual residents research day, Pathology Department, University of Manitoba. Winnipeg, Manitoba, Canada.
- 2003 **Speaker.** Comparative analysis of clinical diagnostic discrepancies in the era of declining autopsy rate. Annual residents research day, Pathology Department, University of Manitoba. Winnipeg, Manitoba, Canada.

F. Research Supervision

1. PRIMARY OR CO-SUPERVISION

Graduate Education

- 2012 Jul - 2014 Jun **Co-Supervisor.** MSc. T. Lin. *Augmenting Rotator cuff repair with endothelial progenitor cells.* Supervisor(s): E. Schemitsch, A. Nauth.

Undergraduate MD

- 2013 Jul - 2014 Jun **Primary Supervisor.** Year 4. E Iakovlev. *Facial Baroparesis: a Critical Differential Diagnosis for SCUBA Diving Accidents.*
- 2013 Jul - 2014 Jun **Primary Supervisor.** Year 4. E Iakovlev. *Anterior Mediastinal Cysts and Pericarditis are an Important Differential Diagnosis: a Case report and Literature Analysis.*

Postgraduate MD

- 2012 Jul - 2014 Jul **Primary Supervisor.** Volunteer research fellow. O. Polyakova. *Analysis of genomic data of breast carcinoma, in view of receptor status.*
- 2010 Jul - 2011 Jun **Co-Supervisor.** Pathology resident research project. W Dubinski. *Automated Image Analysis of Endoglin and Microvascular Density in Clear Cell Renal Cell Carcinoma and Its Prognostic Significance.* Supervisor(s): GM Yousef.
- 2009 Jul - 2010 Jun **Primary Supervisor.** Pathology resident research project. H Faragalla. *Benign symmetric lipomatosis as a late complication to chemotherapy, a case report.*
- 2009 - 2010 **Primary Supervisor.** Pathology resident research project. M. Sidiropoulos. *Rising incidence of syphilis infection in Canada: a case report of syphilis placentitis.*